

LA  
GROTTE  
DU

CLAUDE



PRIMITIF  
QUANTIQUE

PAQUET



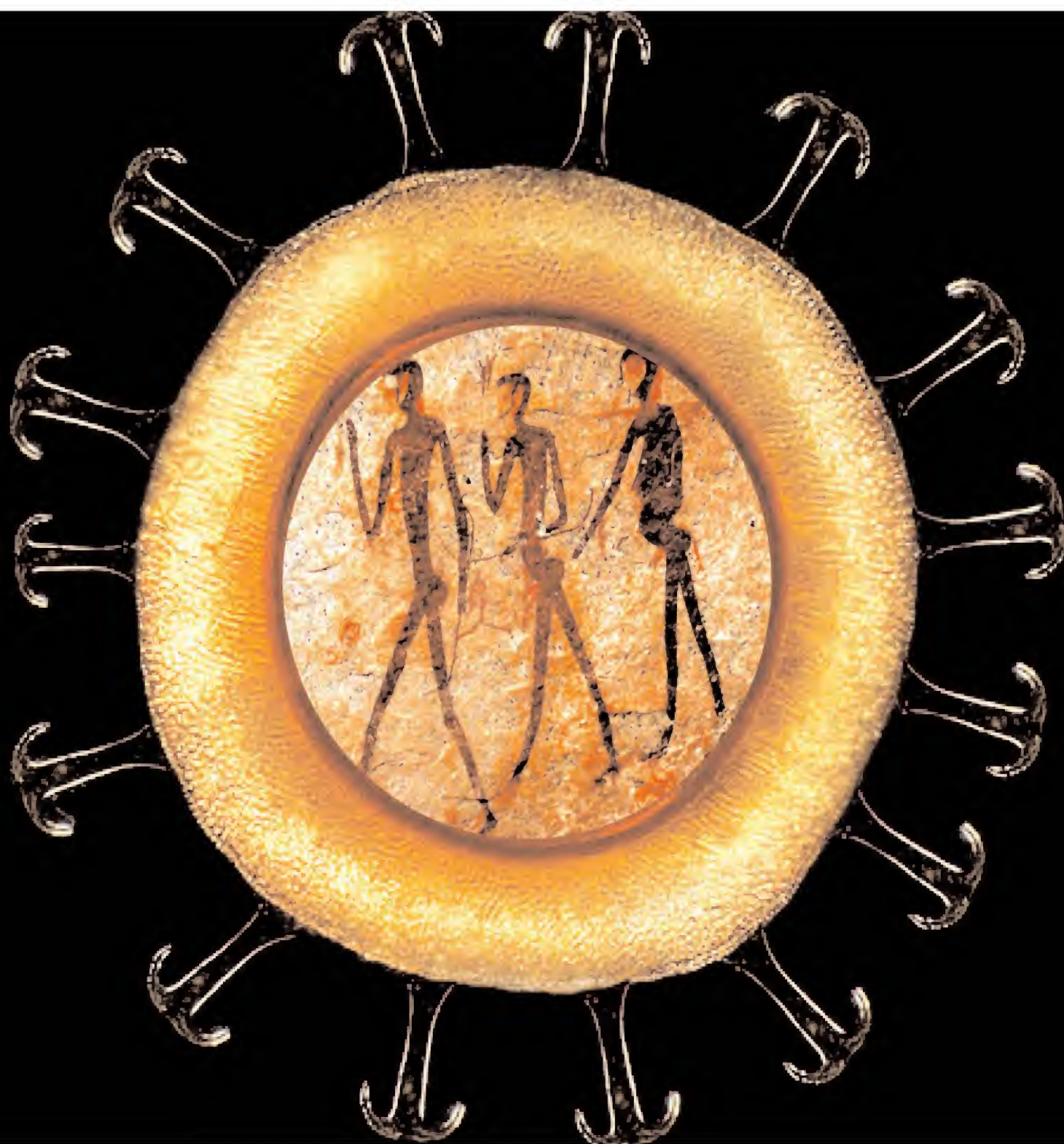














Bar...  
SW 87

$$C(x, Q^2) = g_s \int \frac{d^4k}{(2\pi)^4} \dots$$

DYNNLO<sup>5105</sup>

$$= g_s L g + \frac{4}{9} x C^{\text{int}}(x, Q^2)$$

123 < 127  
125 GeV

NLO+NNLL

$$C(x, Q^2) + O(\alpha_s)$$

NLO+NNLL

$$C(x, Q^2) = C^{\text{int}}(x, Q^2)$$

$$+ g_s L g$$

125 < 127.5

125.2 GeV



$$d^2(w S^2) + \dots$$

$$\frac{n^2}{h} \dots$$

$$\frac{1}{m} \dots$$

$$\frac{1}{n} \dots$$

$$\frac{1}{B_0} \Delta$$



Bar...

SW 87

(re)

$$C(x, Q^2) = g_s \int_0^1 dx' C(x', Q^2)$$



$$= g_s \left[ \frac{1}{2} + \frac{1}{2} \ln \left( \frac{Q^2}{\mu^2} \right) \right]$$

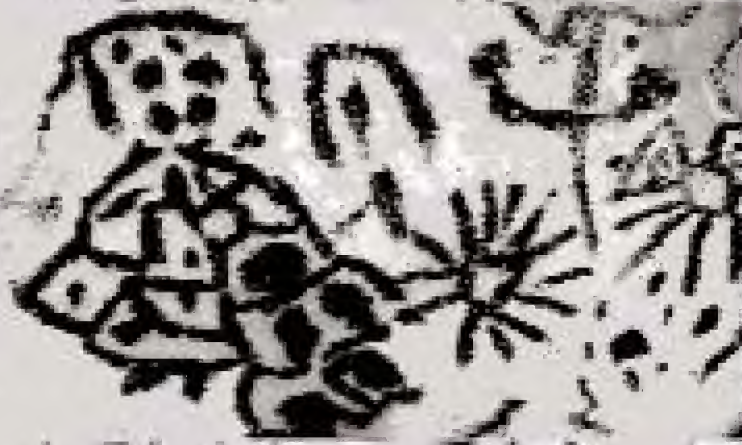
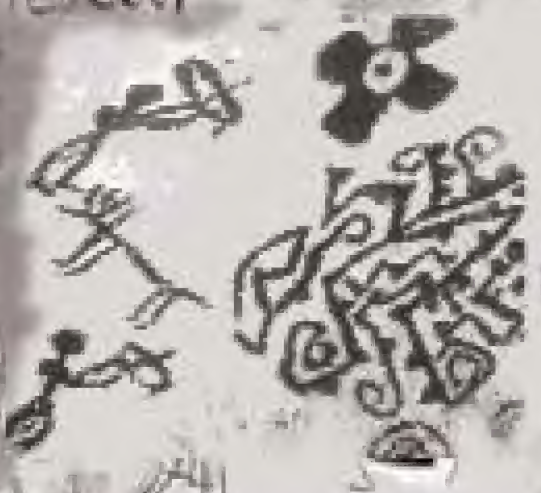
125C C123

DYNAMO

NLO = NNLO

1NLO

NNLO



$\lambda = 9.49$



125.2 GeV

100 GeV

100 GeV

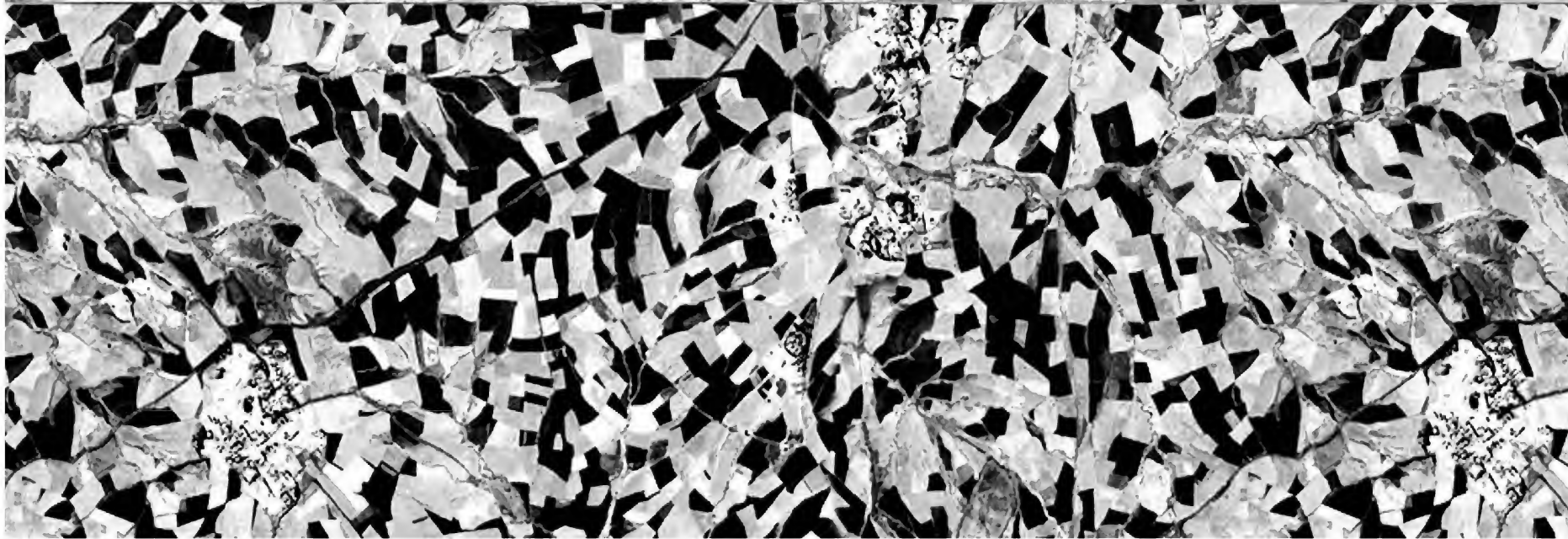
100 GeV

100 GeV

100 GeV

100 GeV





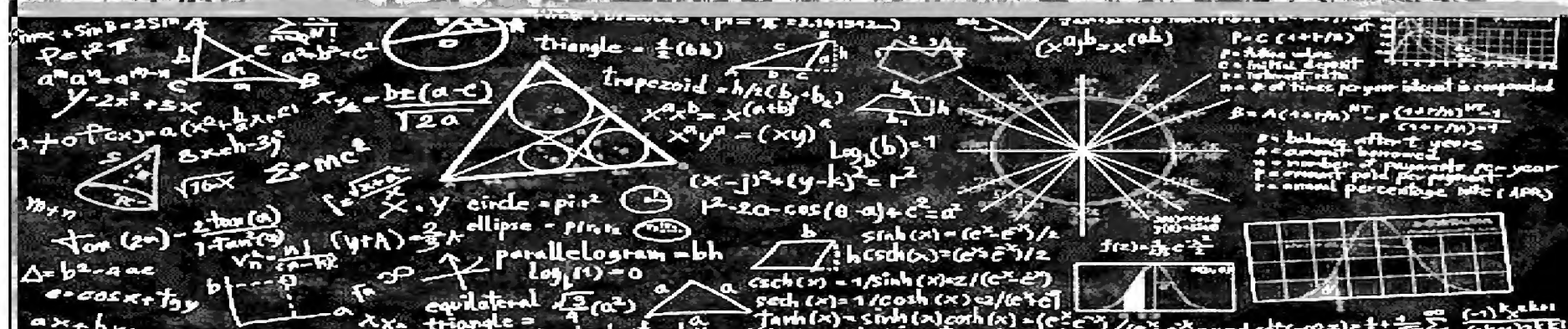
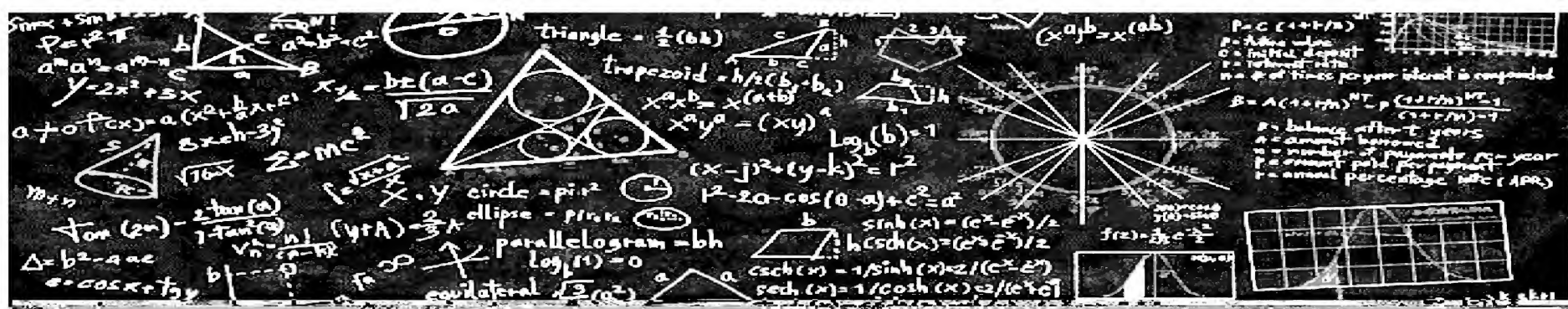












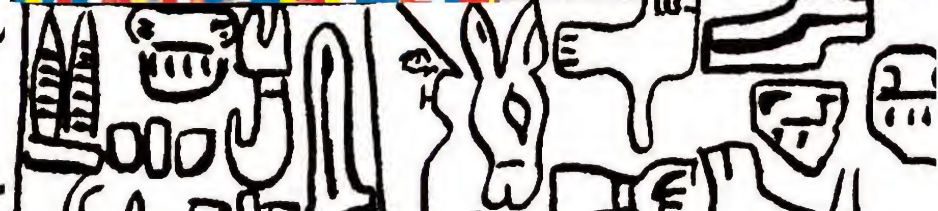
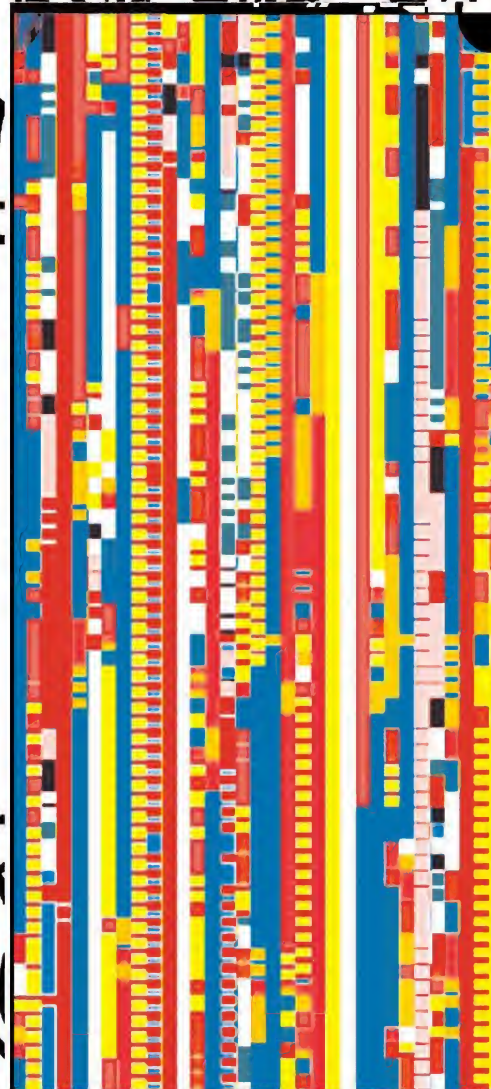
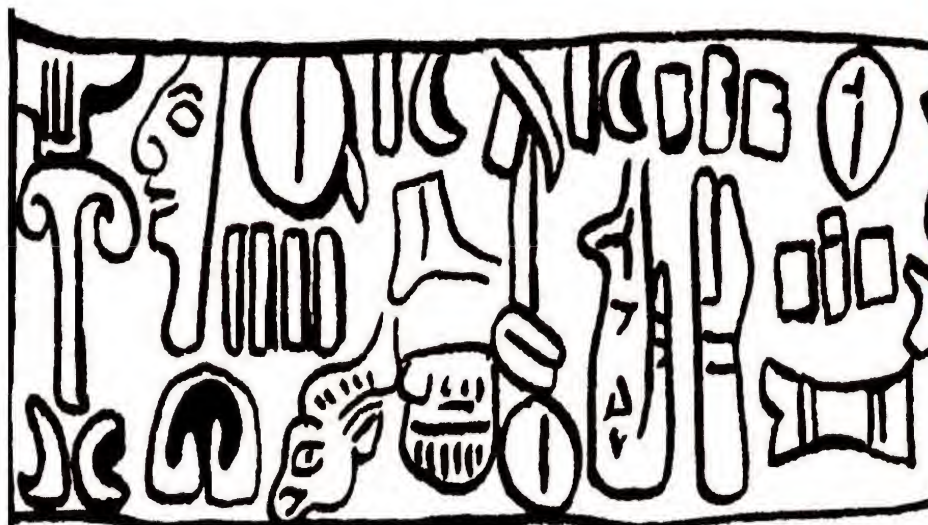
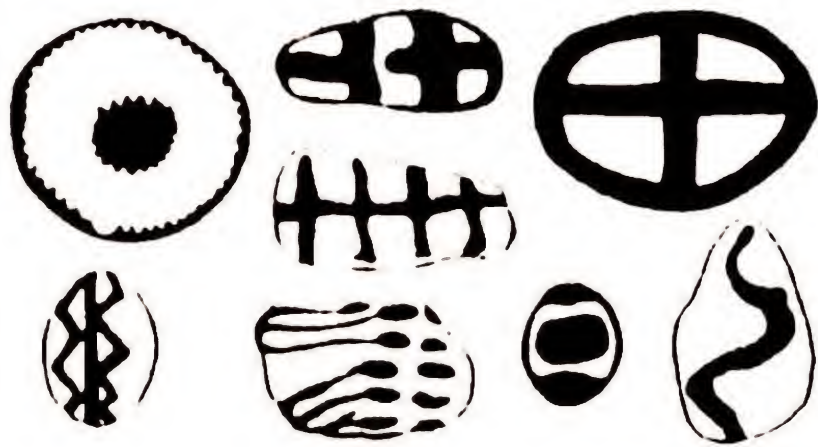
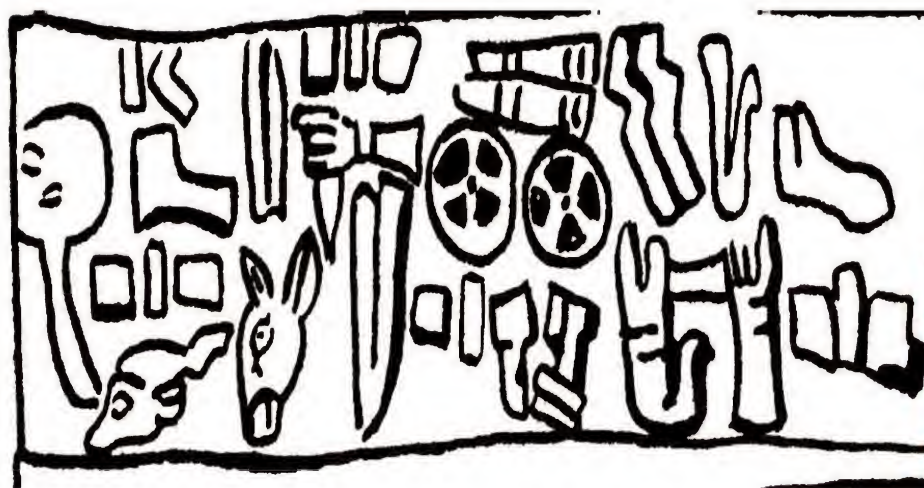




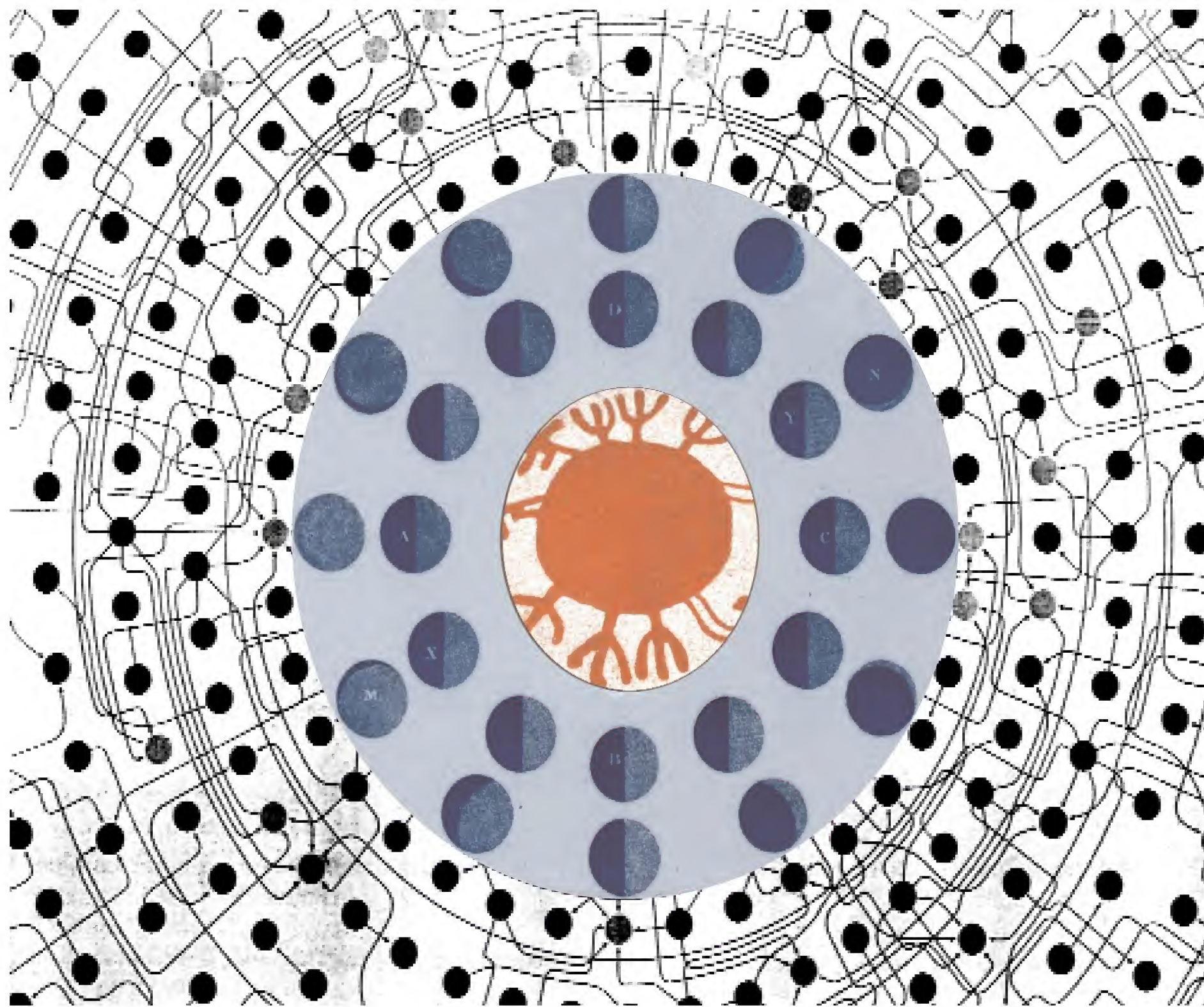












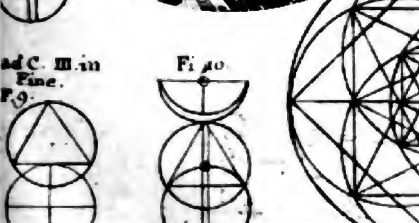
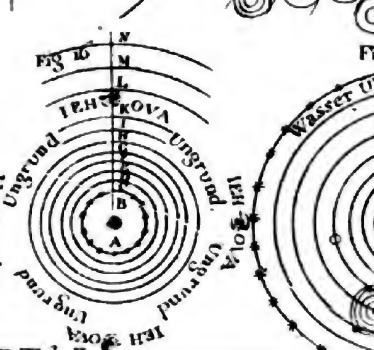
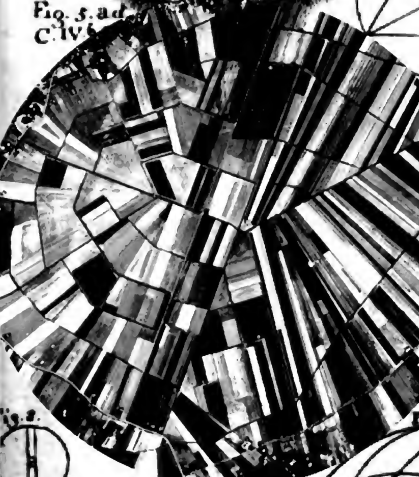
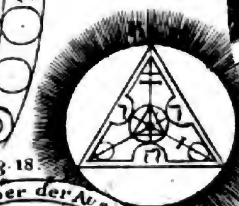
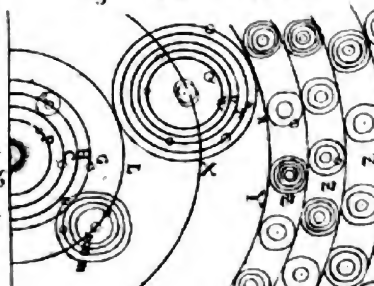
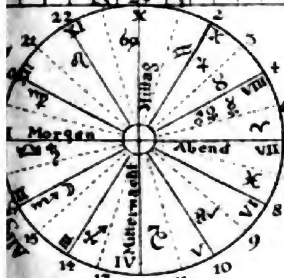
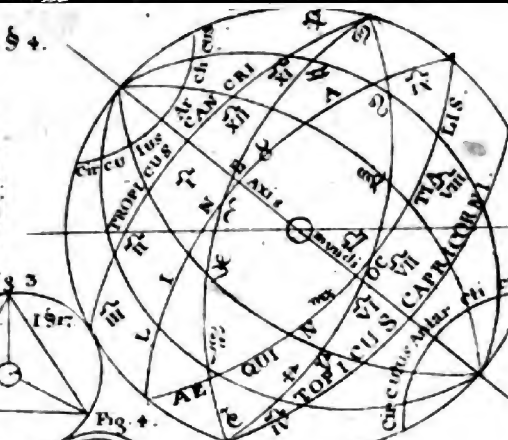
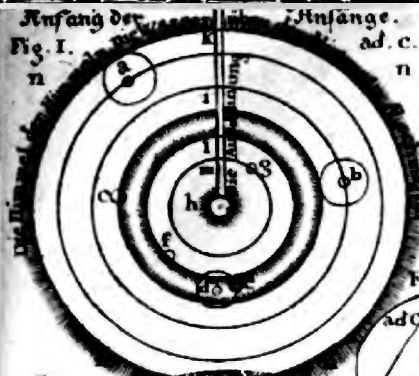
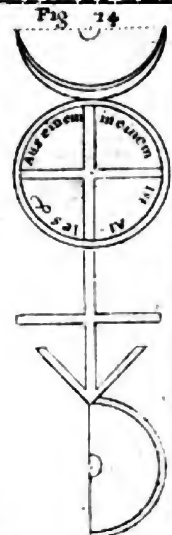
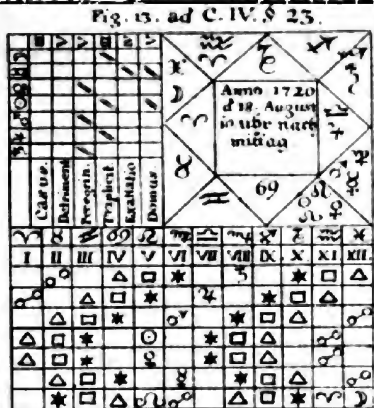
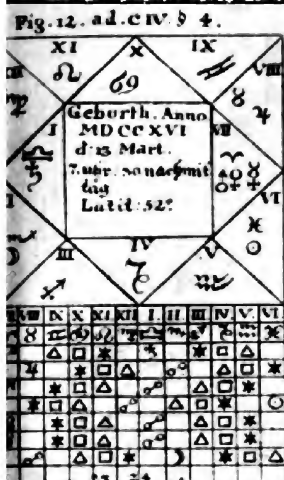


$$M_1 = A, B, \dots, E, z = \sqrt{4+4} = 2$$

$$d \ln M = 0 \quad H_5 = 1 + 4 + 3 + 4 + 5 + \dots$$

$$a_n = -\frac{1}{R} \left( \frac{1}{\ln R} \frac{d a_n}{d z} \right) = \frac{1}{R} \left( \frac{1}{\ln R} \frac{d a_n}{d z} \right)$$

$$\sum_{k=0}^{\infty} \frac{1}{k!} \ln t^k = \sum_{k=0}^{\infty} \frac{1}{k!} \ln t^k$$



$$[P_1, P_2] = (e^{i\theta_1} - e^{i\theta_2}) \bar{P}_1 + q$$

$$[P_1, P_2] = (e^{i\theta_1} - e^{i\theta_2}) \bar{P}_1 + q$$

$$[P_1, P_2] = (e^{i\theta_1} - e^{i\theta_2}) \bar{P}_1 + q$$



Handwritten mathematical and scientific notes on the left side of the page, including:

- Equations:  $V = \sqrt{\frac{T}{P}}$ ,  $a = \frac{V_0}{R}$ ,  $y = x^2 - 4x + 5$ ,  $z = \frac{(2+3)^2}{1} + \frac{(-1)^2}{1}$ ,  $4.8 \sqrt{16-20}$ ,  $4+F_4$ ,  $4+2$ ,  $4-2 \rightarrow 1-1$ ,  $10 \cdot 5 \cdot 4 = 0$ ,  $10 \cdot 10 \cdot 10 = 1000$ .
- Chemical structures: A molecule with OH and N groups, and a diagram of a molecule with F and H atoms.
- Diagrams: A bar chart with three bars, a graph of a sine wave, and a diagram of a circuit with a battery and a switch.

Handwritten mathematical and scientific notes in the center of the page, including:

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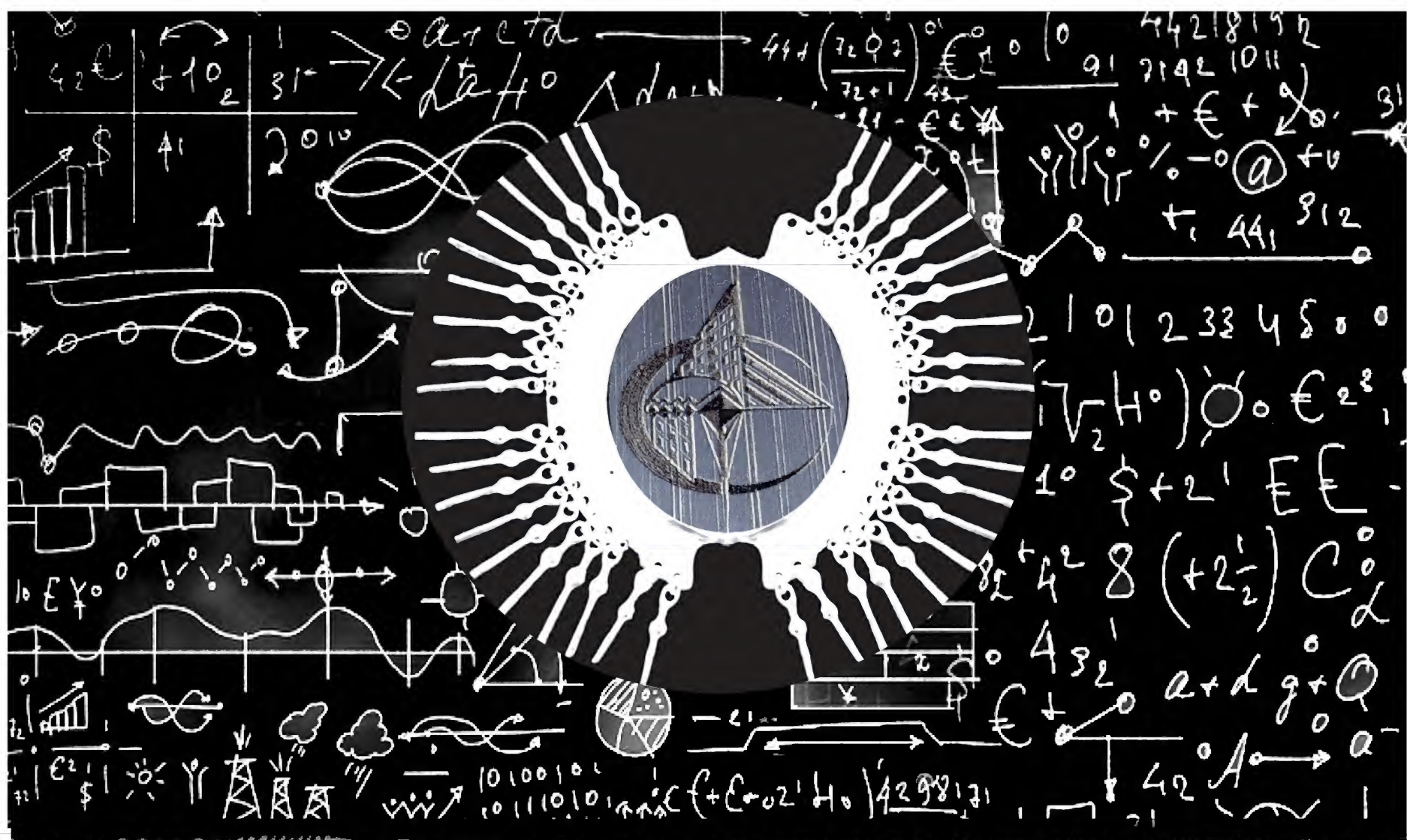
Handwritten mathematical and scientific notes on the right side of the page, including:

- Equations:  $z = \frac{(2+3)^2}{1} + \frac{(-1)^2}{1}$ ,  $4.8 \sqrt{16-20}$ ,  $4+F_4$ ,  $4+2$ ,  $4-2 \rightarrow 1-1$ ,  $10 \cdot 5 \cdot 4 = 0$ ,  $10 \cdot 10 \cdot 10 = 1000$ .
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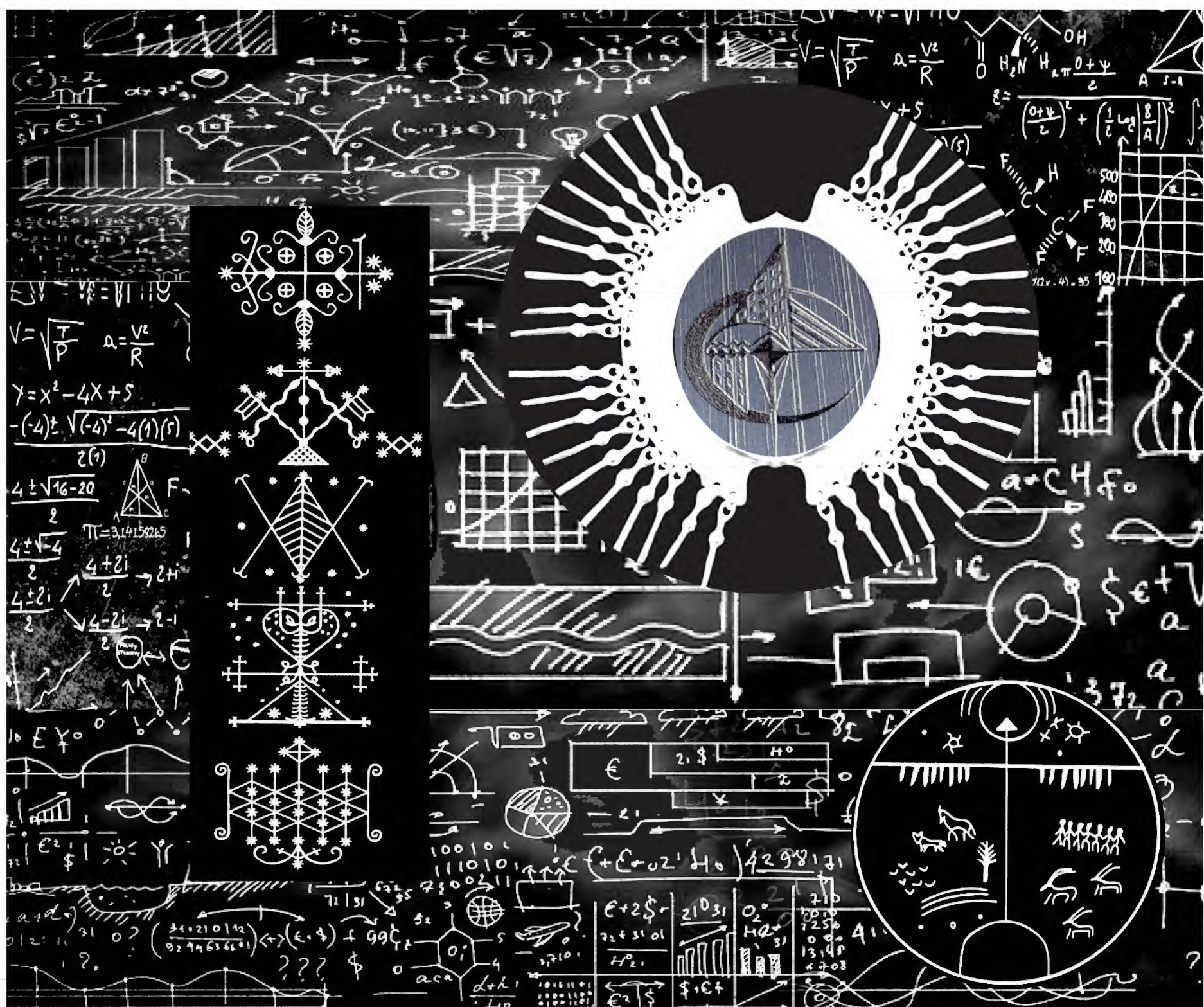


Handwritten mathematical notes and diagrams, including various equations and symbols, possibly related to algebra or geometry. The notes are dense and cover most of the page.





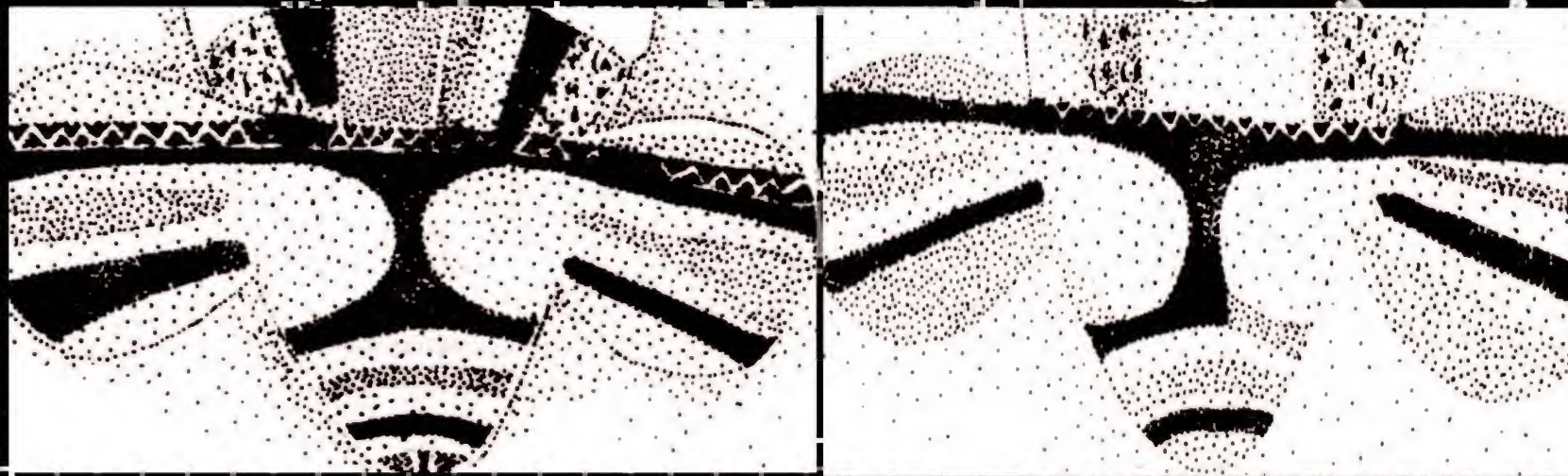












Virus Laboratory v.2.0  
Virus Laboratory version 2.0 Is Written By [Damen].  
Press The Number Of An Option To Change It.







$$A \cdot \Delta B \geq \frac{1}{2} \left| \left\langle [A, \hat{B}] \right\rangle_T - \hbar^2 \frac{\partial^2 \Psi(\vec{r}, t)}{\partial t^2} \right|$$

$$\hbar^2 \frac{\partial^2 \Psi(\vec{r}, t)}{\partial t^2} = -\hbar^2 c^2 \Delta \Psi(\vec{r}, t) + m^2 c^4 \Psi(\vec{r}, t)$$

$$R_{\mu\nu} - \frac{1}{2} g_{\mu\nu} R - \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu} \hbar^2 \frac{\partial^2 \Psi(\vec{r}, t)}{\partial t^2} = -\hbar^2 c^2 \Delta \Psi(\vec{r}, t) + m^2 c^4 \Psi(\vec{r}, t)$$

$$|\psi\rangle = \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{pmatrix}_\epsilon = \begin{bmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{bmatrix} \cdot [|u_1\rangle \quad |u_2\rangle \quad \cdots \quad |u_N\rangle] \quad \langle\phi| = \begin{pmatrix} \phi_1 \\ \phi_2 \\ \vdots \\ \phi_N \end{pmatrix}_{\epsilon^*} = [\phi_1 \quad \phi_2 \quad \cdots \quad \phi_N] \cdot \begin{bmatrix} \langle u_1| \\ \langle u_2| \\ \vdots \\ \langle u_N| \end{bmatrix} = \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{pmatrix}_\epsilon = \begin{bmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{bmatrix} \cdot [|u_1$$

$$\frac{1}{3} [\phi_1(r_1)\phi_2(r_2)\phi_2(r_3) + \phi_2(r_1)\phi_1(r_2)\phi_2(r_3) + \phi_2(r_1)\phi_2(r_1)\phi_1(r_3)]$$

初叙意者夫如來一字  
塵其跡六塵之本法佛三密即日  
一密遍法界而常恒五智四身具上  
以悟者号大覺運者名衆生衆生



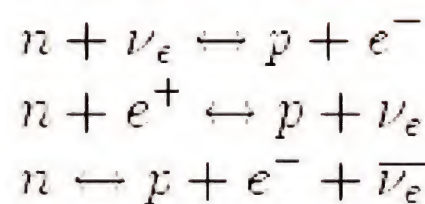
$$r_2)\phi_2(r_3) + \phi_2(r_1)\phi_1(r_2)\phi_2(r_3) + \phi_2(r_1)\phi_2(r_2)\phi_1(r_3)]$$

$$R - \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4} T_{\mu\nu} - \hbar^2 \frac{\partial^2 \Psi(\vec{r}, t)}{\partial t^2} = -\hbar^2 c^2 \Delta \Psi(\vec{r}, t) + m^2 c^4 \Psi(\vec{r}, t)$$

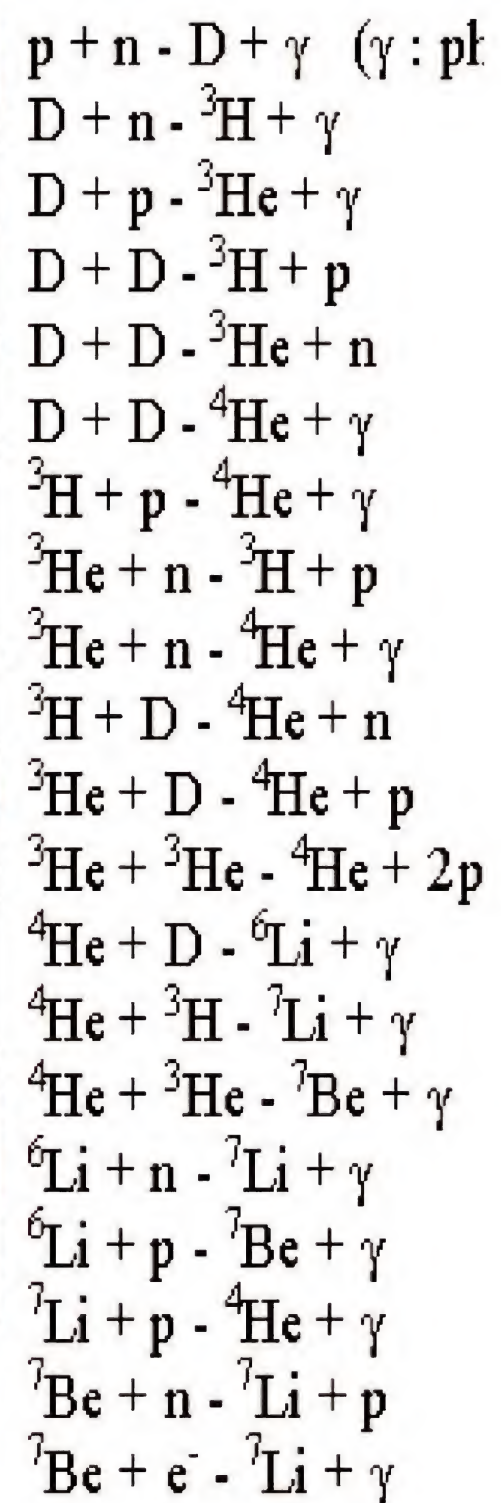
$$\hbar^2 \frac{\partial^2 \Psi(\vec{r}, t)}{\partial t^2} = -\hbar^2 c^2 \Delta \Psi(\vec{r}, t) + m^2 c^4 \Psi(\vec{r}, t)$$

$$\langle\phi|\psi\rangle = \left(\begin{pmatrix} \phi_1 \\ \phi_2 \\ \vdots \\ \phi_N \end{pmatrix}_{\epsilon^*}, \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{pmatrix}_\epsilon\right) = [\phi_1 \quad \phi_2 \quad \cdots \quad \phi_N] \cdot \begin{bmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{bmatrix} = \sum_{n=1}^N \phi_n \cdot \psi_n, \langle\phi| = \begin{pmatrix} \phi_1 \\ \phi_2 \\ \vdots \\ \phi_N \end{pmatrix}_{\epsilon^*} = [\phi_1 = \left(\begin{pmatrix} \phi_1 \\ \phi_2 \\ \vdots \\ \phi_N \end{pmatrix}_{\epsilon^*}, \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{pmatrix}_\epsilon\right) =$$





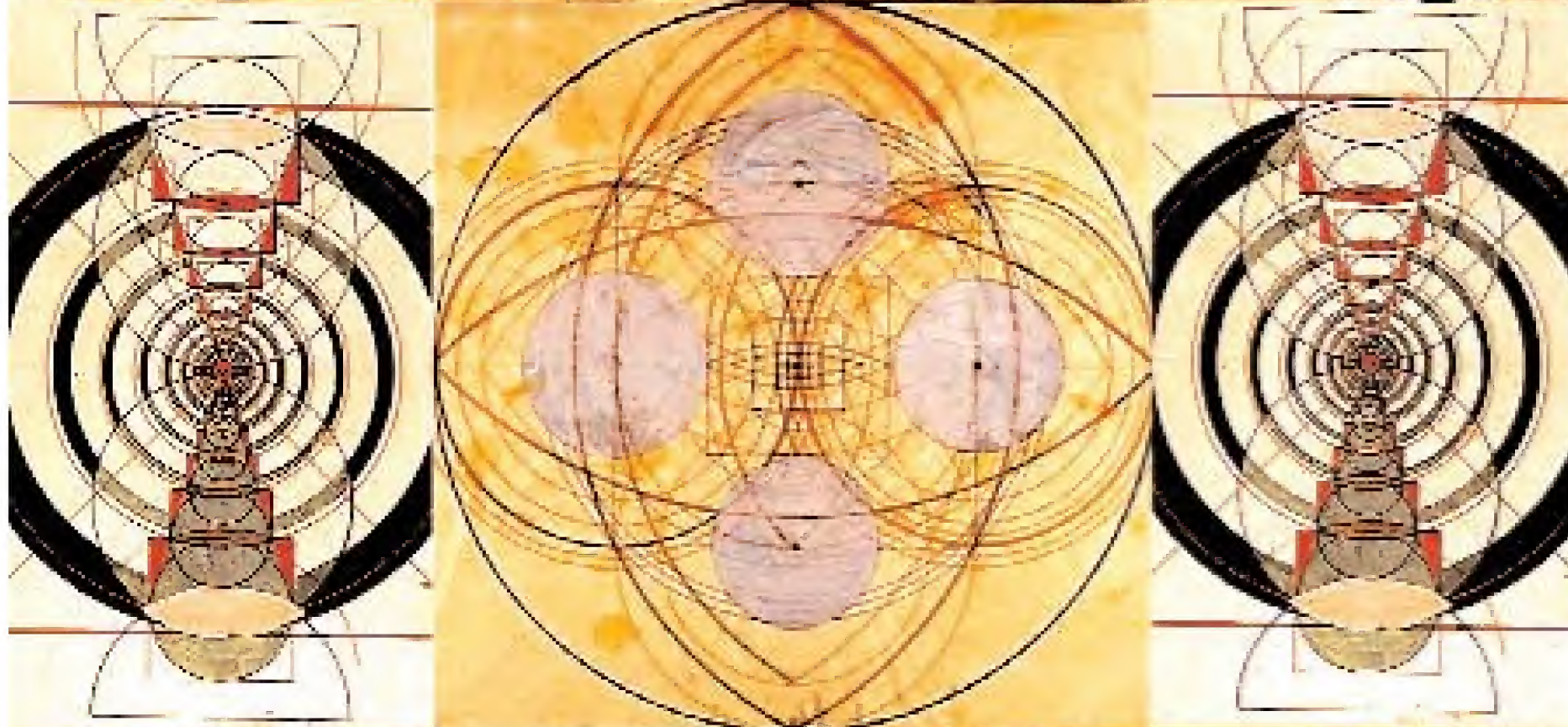
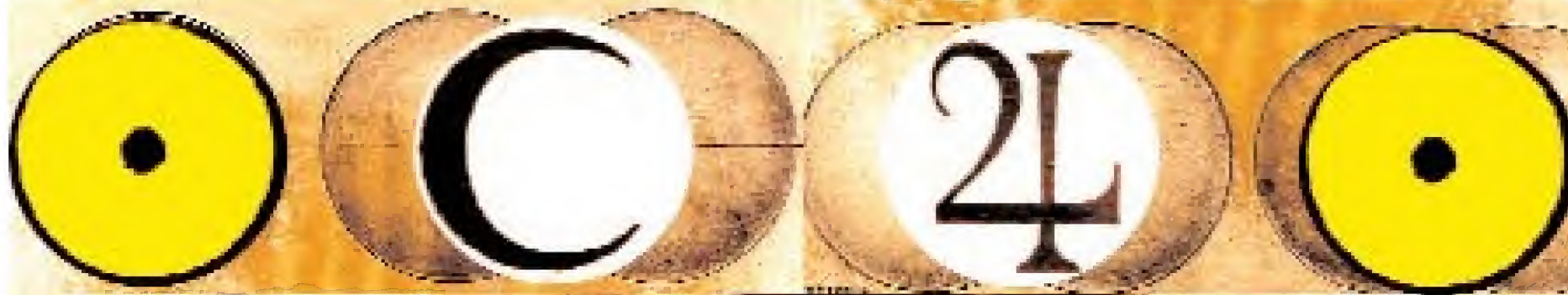
$$\frac{n_p}{n_n} = e^{-\frac{E_p - E_n}{kT}} = e^{-\frac{\Delta mc^2}{kT}}$$













$$\mathbb{P}=\sigma T^{\frac{1}{\pi}}$$



$$H=\sum_k$$

$$\varphi^{Einstein}=\frac{6\,\pi\,G\,M_S}{c^2\,a\,(1-e^2)}$$

$$_ka_k^{\dagger}a_k$$



$$\vec{F}_{12}=\Delta G\frac{m_1m_2}{d^2}\vec{u}_{12}$$

$$\Delta\varphi=\varphi_{exp}-\varphi_{RG}=\varphi_{Newton}$$



$$g(0)=a\;;\;g(n+1)=f(g(n))y=g(x)\;??\;|\;[a(l,0)=a\;??\;i<x\hat{a}(l,i+1)=f(a(l,i))\;??\;y=\hat{a}(l,x)]$$

$$\frac{24\,\pi^3\,a^2}{T^2\,c^2\,(1-e^2)}$$



$$g(0)=a\;;\;g(n+1)=f(g(n))y=g(x)\;??\;|\;[a(l,0)=a\;??\;i<x\hat{a}(l,i+1)=f(a(l,i))=f(\hat{a}(l,$$



$$\varphi_{Newton}$$

$$\lambda_{max}=\frac{hc}{4,965\cdot kT}=\frac{18\cdot 10^{-3}}{T}$$

$$\frac{hc}{45\cdot kT}=\frac{2,898\cdot 10^{-3}}{T}$$

$$R_{\mu\nu}-\frac{1}{2}g_{\mu\nu}R-\Lambda\,g_{\mu\nu}=\frac{8\pi G}{c^4}$$

$$\lambda=\frac{n}{p}$$

$$\begin{array}{l} ?xA? ?xB? ?x(A?B)\;;\; ?x?yA(x,y)\;?N\;?z\;?x?z\;?y?z\;A(x,y)\;;\; ?xA\\ ?\;?yB\;? ?x?y\;(A?B)\;;\; ?x?z\;?y\;A(x,y)\;?N? \;u\;?x?z\;?y?u\;A(x,y). \end{array}$$



$$g(0)=a\;;\;g(n+1)=f(g(n))y=g(x)\;??\;|\;[a(l,0)=a\;??\;i<x\hat{a}(l,i+1)=f(a(l,i))\;??\;y=\hat{a}(l,x)]$$



$$\pm\,0.45$$

$$\varphi^{Einstein}\simeq 0.08$$

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$$\pm\,0.45$$

$$\lambda_{max}=\frac{hc}{4,965\cdot kT}=\frac{2,898\cdot 10^{-3}}{T}$$

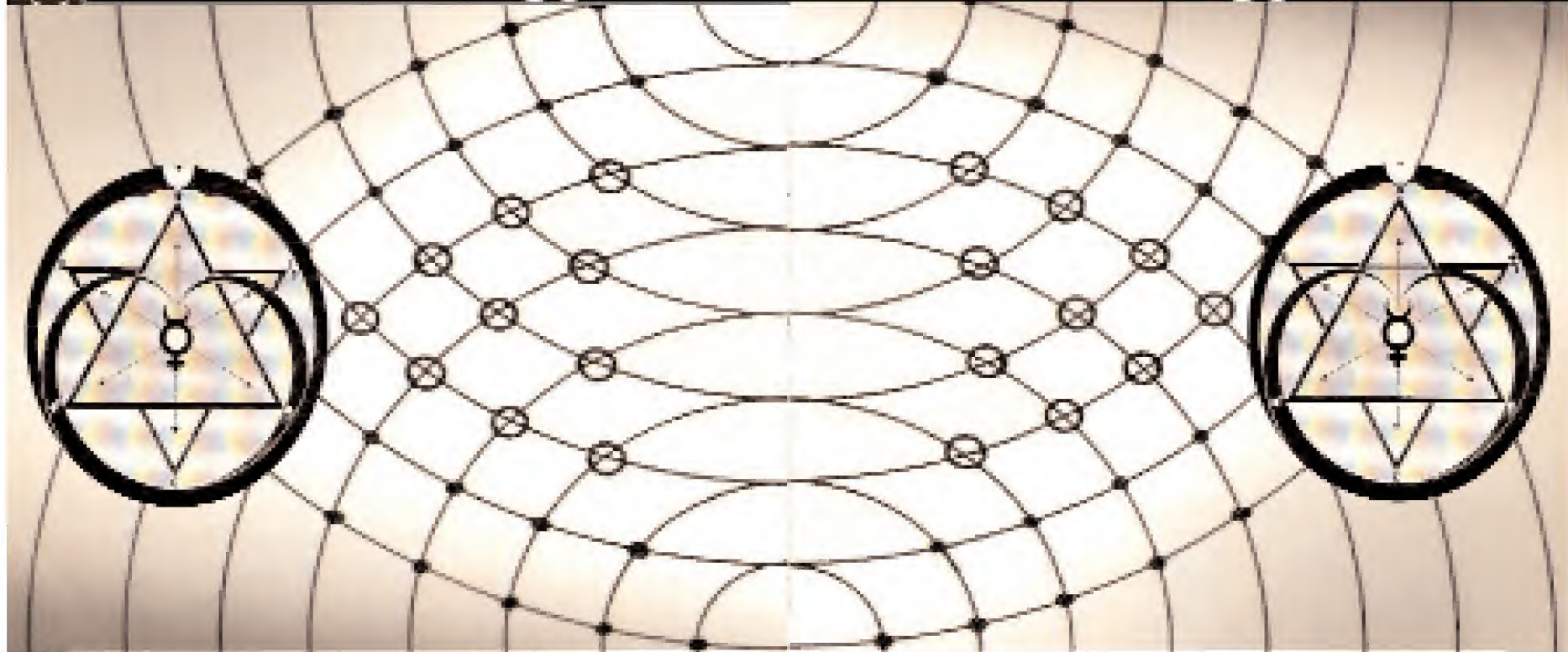




$$\hbar^2 \frac{\partial^2 \Psi(\vec{r}, t)}{\partial t^2} - \hbar^2 c^2 \Delta \Psi(\vec{r}, t) + m^2 c^4 \Psi(\vec{r}, t) = \hbar^2 \frac{\partial^2 \Psi(\vec{r}, t)}{\partial t^2} - \hbar^2 c^2 \Delta \Psi(\vec{r}, t) + m^2 c^4 \Psi(\vec{r}, t)$$

$$|\psi\rangle = \begin{pmatrix} \langle \phi_1 | \\ \langle \phi_2 | \\ \vdots \\ \langle \phi_N | \end{pmatrix} \cdot \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{pmatrix} = |\phi_1 \phi_2 \dots \phi_N| \cdot \begin{bmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{bmatrix} = \sum_{i=1}^N \phi_i \cdot \psi_i |\phi_i\rangle = \begin{pmatrix} \phi_1 \\ \phi_2 \\ \vdots \\ \phi_N \end{pmatrix} \cdot \begin{pmatrix} \psi_1 \\ \psi_2 \\ \vdots \\ \psi_N \end{pmatrix}$$

$$H |\psi(t)\rangle = i\hbar \frac{\partial}{\partial t} |\psi(t)\rangle \quad H |\psi(t)\rangle = i\hbar \frac{\partial}{\partial t} |\psi(t)\rangle$$



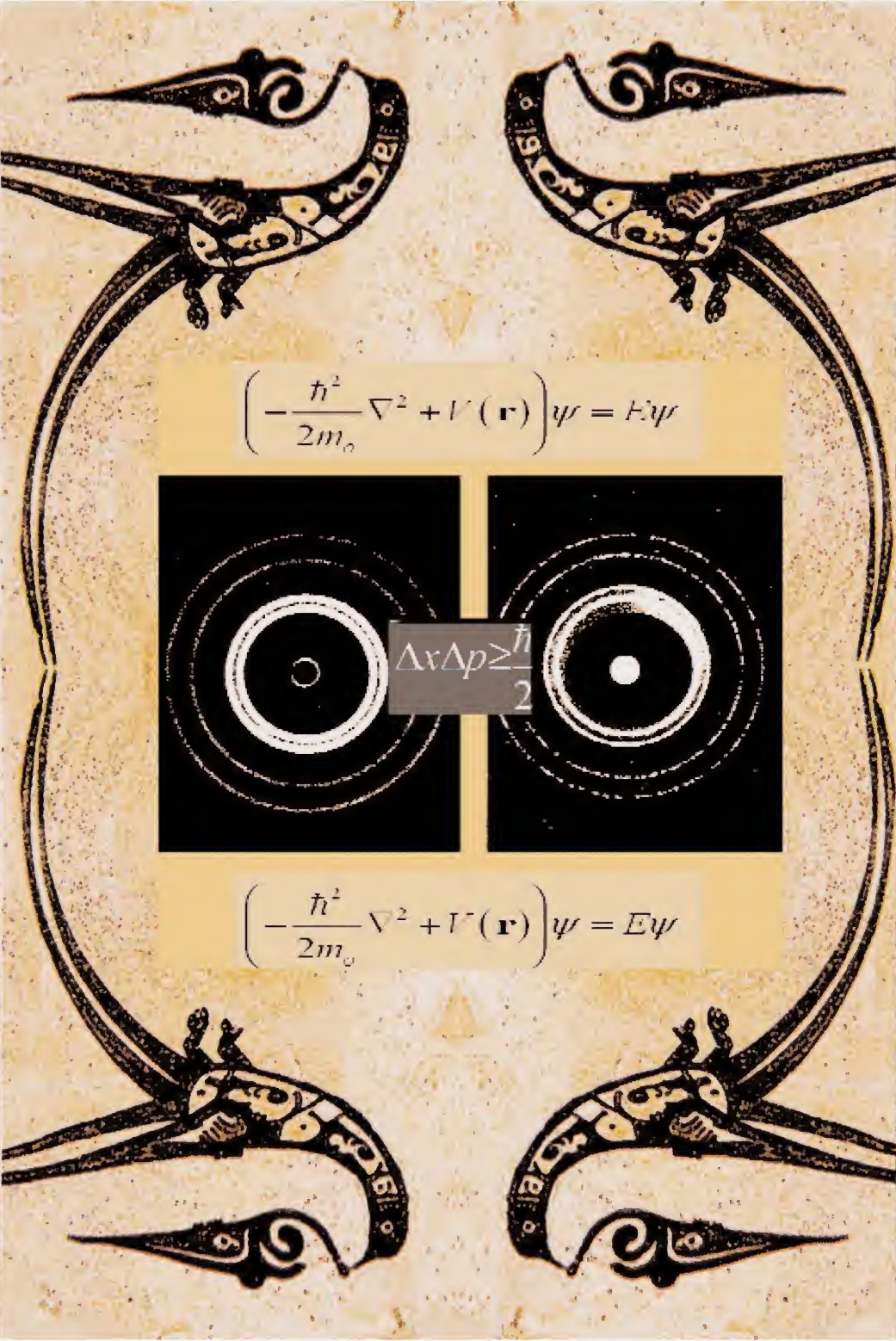
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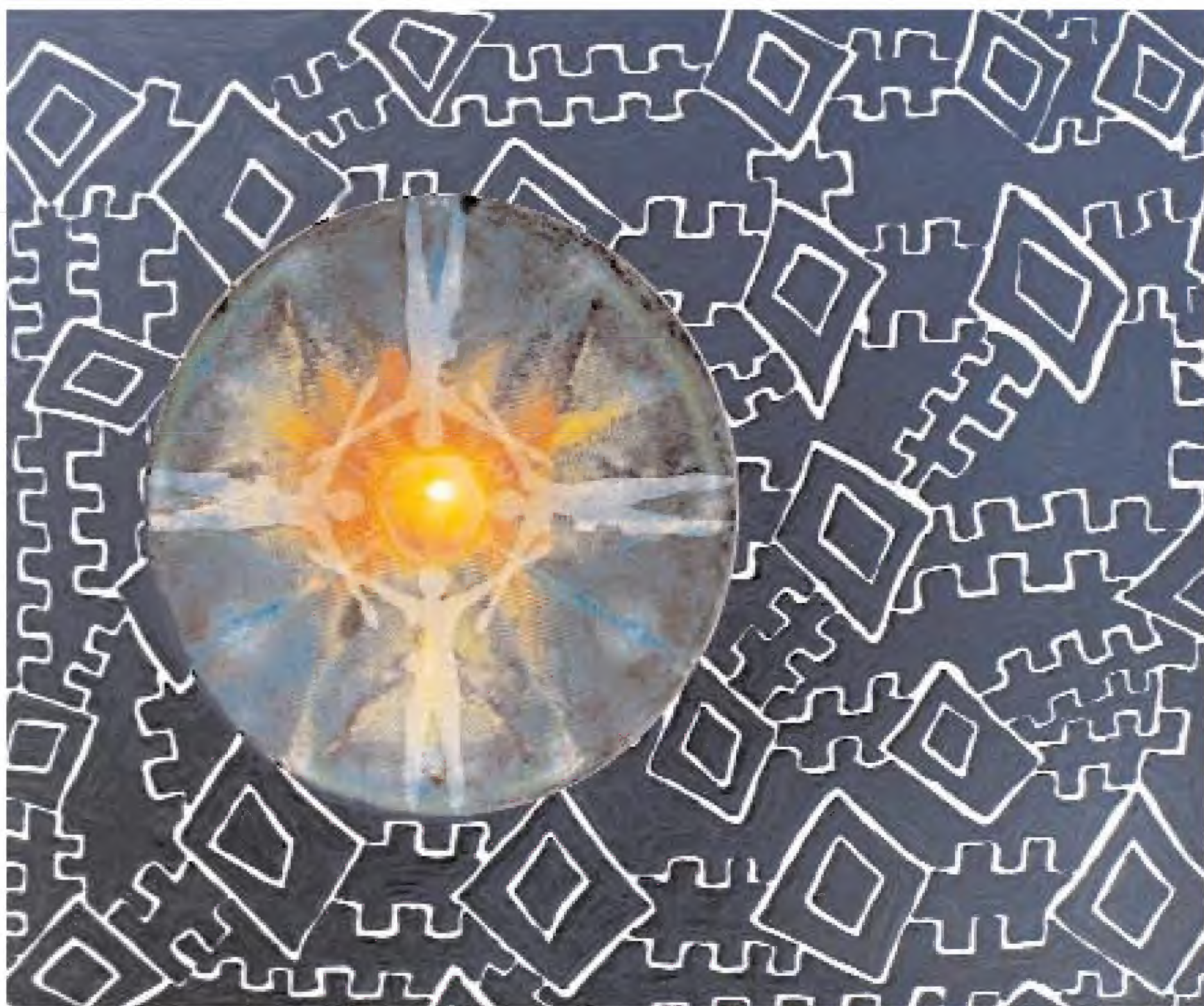


Handwritten text in a cursive script, likely a historical form of a modern language, running vertically along the left margin of the page.

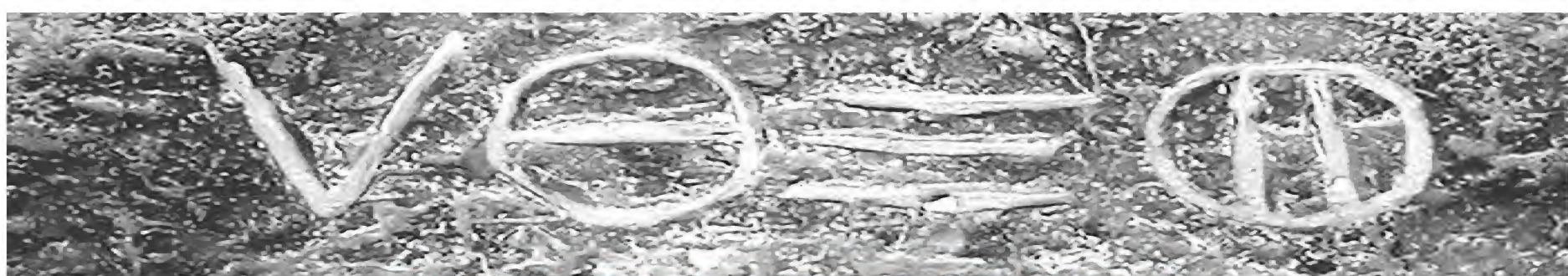


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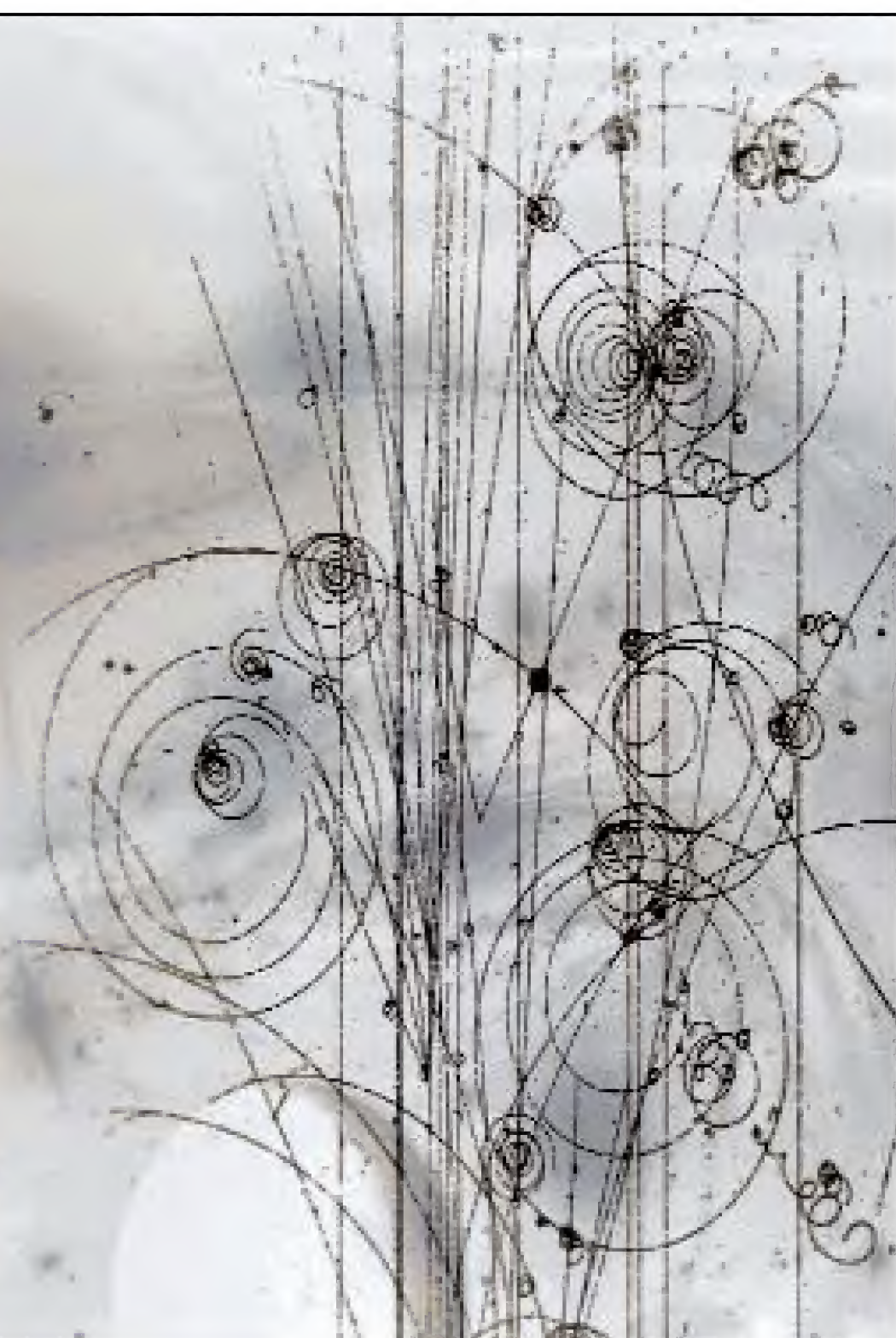




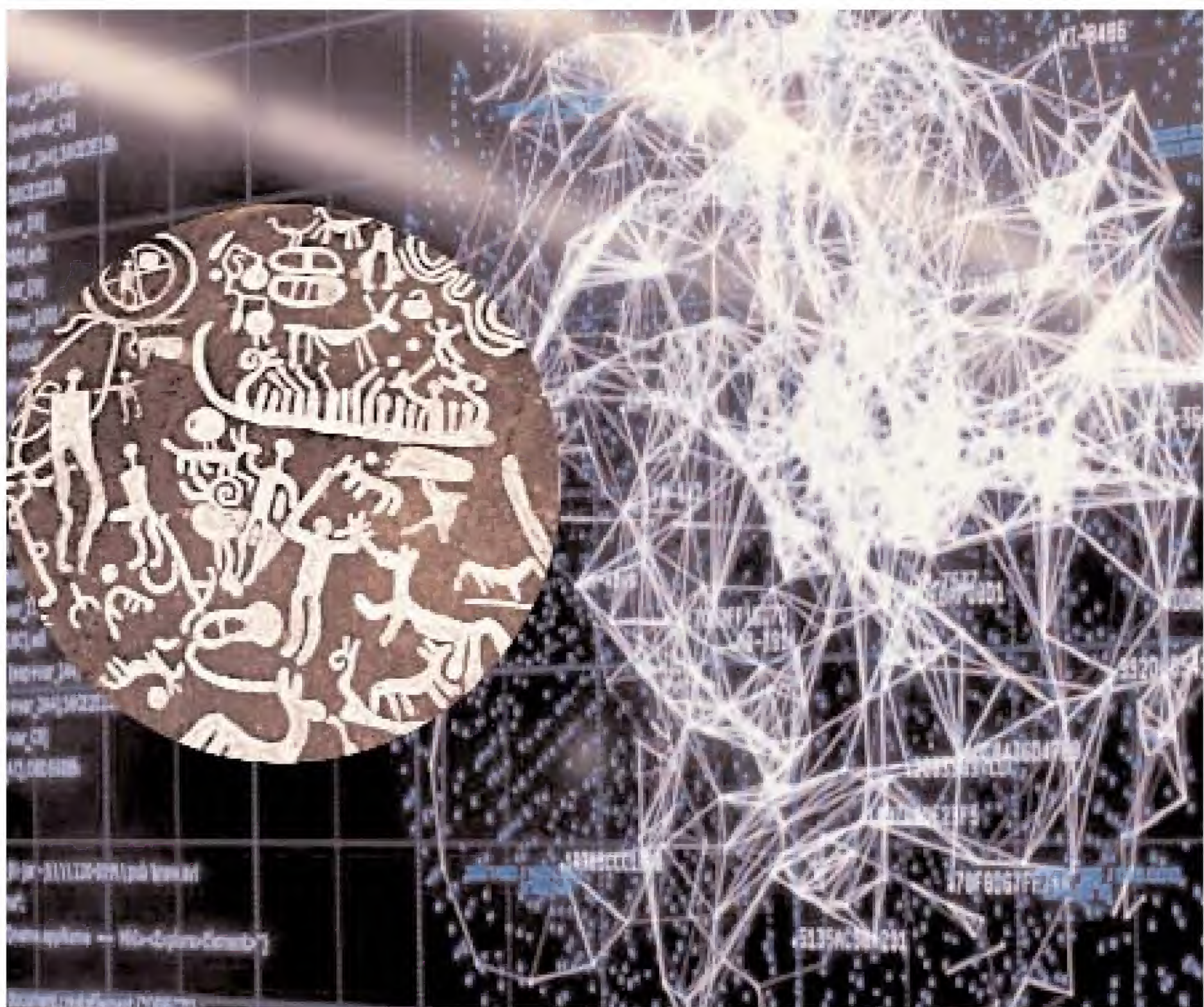




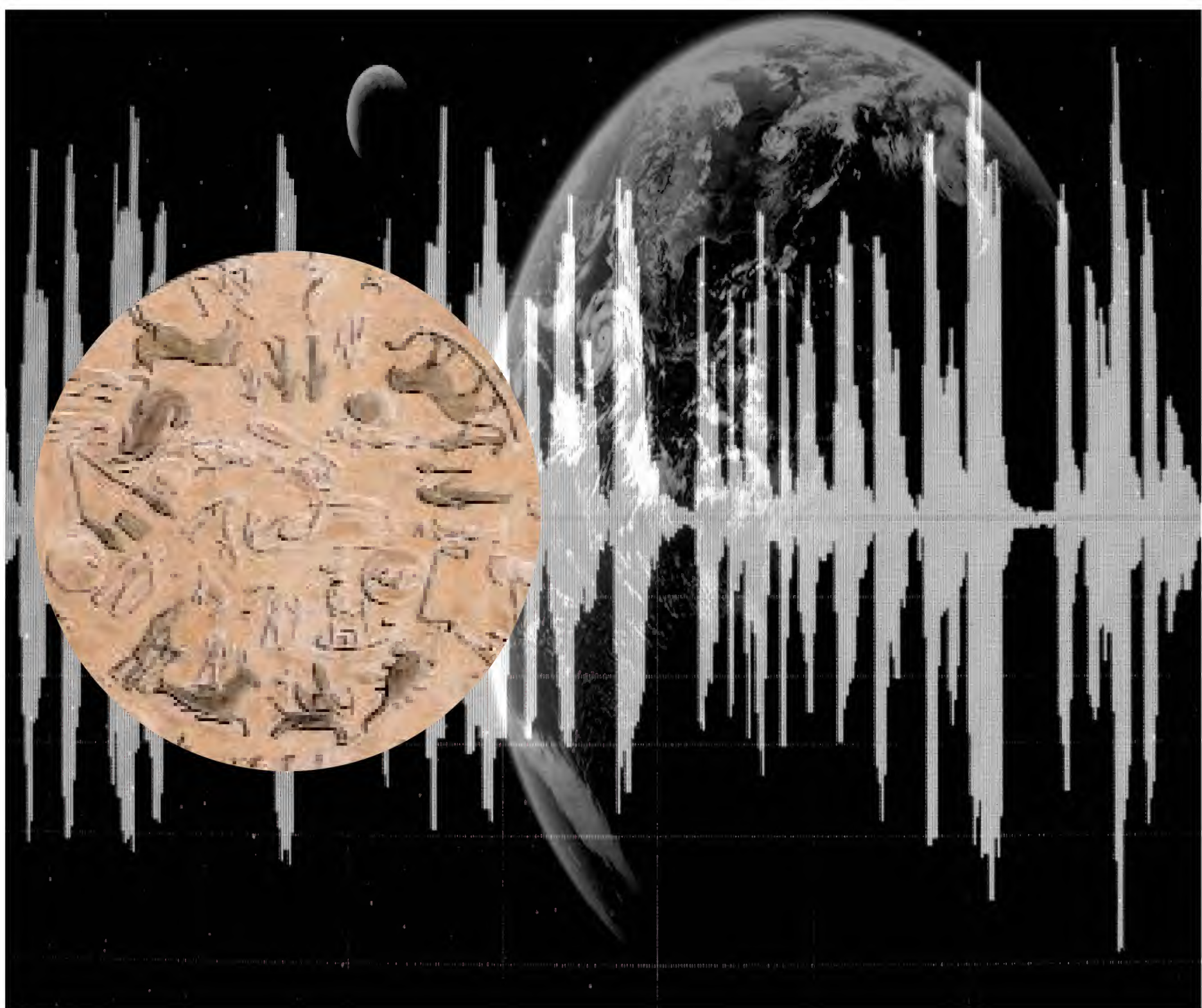














$$Y_{i+1} = Y_i + h \cdot K_i$$

$$B = \begin{pmatrix} 2 & 1 & -1 & 0 \\ 3 & 0 & 1 & 2 \end{pmatrix}$$

$$(x_j - y_j)^2 \quad y_j = \frac{\sin x}{1 + y^2} \quad \text{or } y = \frac{\sin x}{\cos x}$$

$$\begin{aligned} \lambda x - y + z &= \\ x + \lambda y + z &= \\ x + y + z &= \end{aligned}$$

$$\text{rads} \left| \frac{dx}{dy} \right| dy$$

$$\lim_{n \rightarrow \infty} \frac{\sqrt{n^2 + 1} + n}{3\sqrt{3n^2 + 2n} - 1}$$

$$\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = 44$$



$$y = \sqrt{3x+1}$$

$$A_2 = \begin{pmatrix} 1 & 1 & 1 & 1 \\ 1 & 3 & 2 & 1 \\ 6 & 3 & 7 & 7 \end{pmatrix} \quad C = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$$

$$a^2 + b^2 = c^2 \quad a, b, c \in \mathbb{C}$$

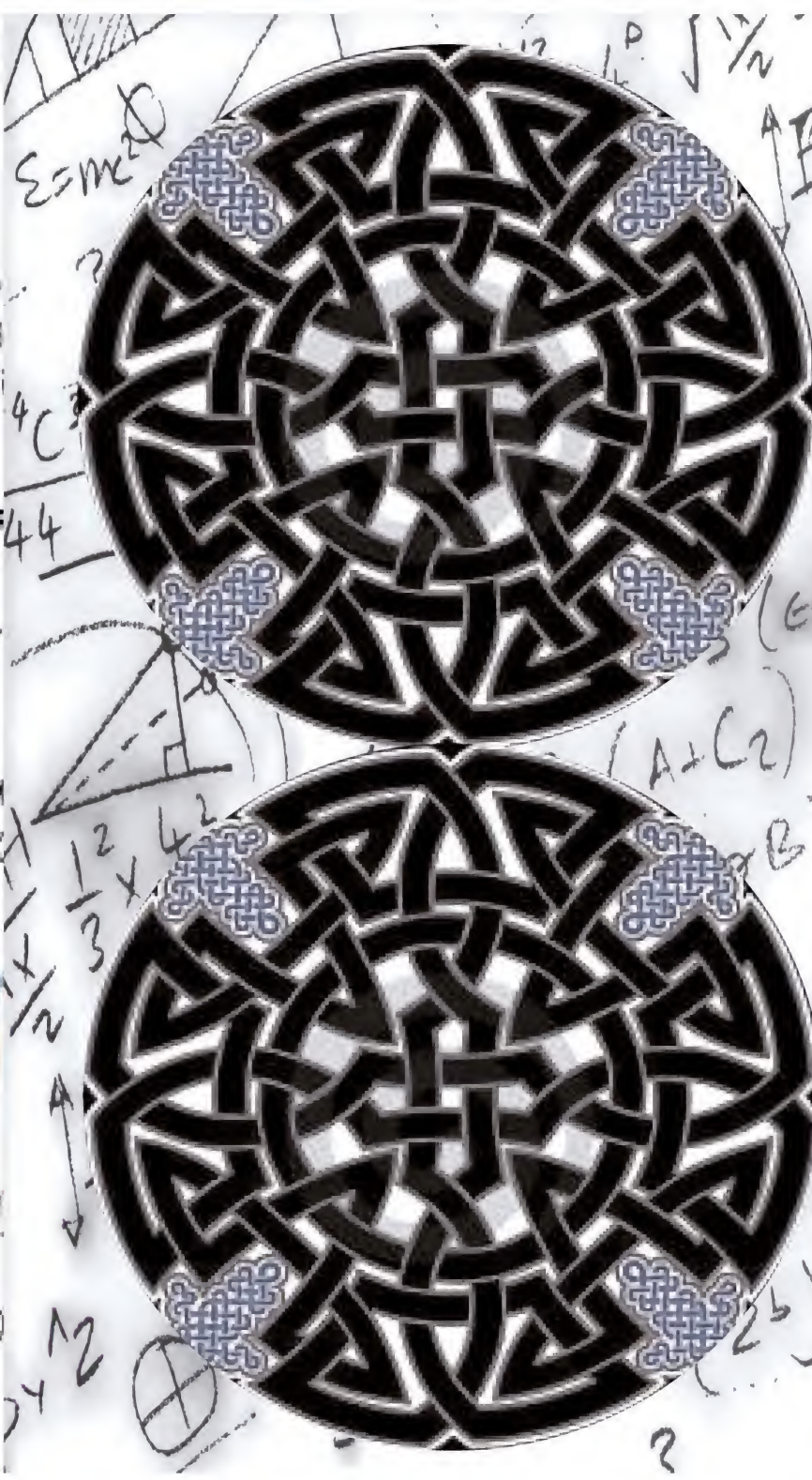
$$f(x) = 2^{-x} + 1, \epsilon = 0.005$$

$$e^2 - x y z = e; A(0, e, 1)$$

$$\lim_{x \rightarrow 0} \frac{a^{2x} - 1}{5x} = \frac{2}{5}$$

$$k|A| \neq 0; p \neq 0$$

$$+16\sqrt{3} \cdot 42 > 0$$



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$$+16\sqrt{3} \cdot 42 > 0$$



$$r = \sin \theta \quad \text{for } 0 \leq \theta \leq \pi/2 \quad (1, 2) \quad (3, 4) \quad 0 \leq \theta \leq \pi/2 \rightarrow (3)$$

$$P_2(V_1 - V_2) = P_2(V_2 - V_1)$$

$$dV = - \left( \frac{P}{r^2} \right) dr$$

$$R(T_2 - T_1) = -nR \cdot \left[ \frac{P_2 V_1}{nR} - \frac{P_2 V_2}{nR} \right]$$



$\theta$	$r$
$\pi/6$	$-1/2$
$4\pi/3$	$-\sqrt{3}/2$

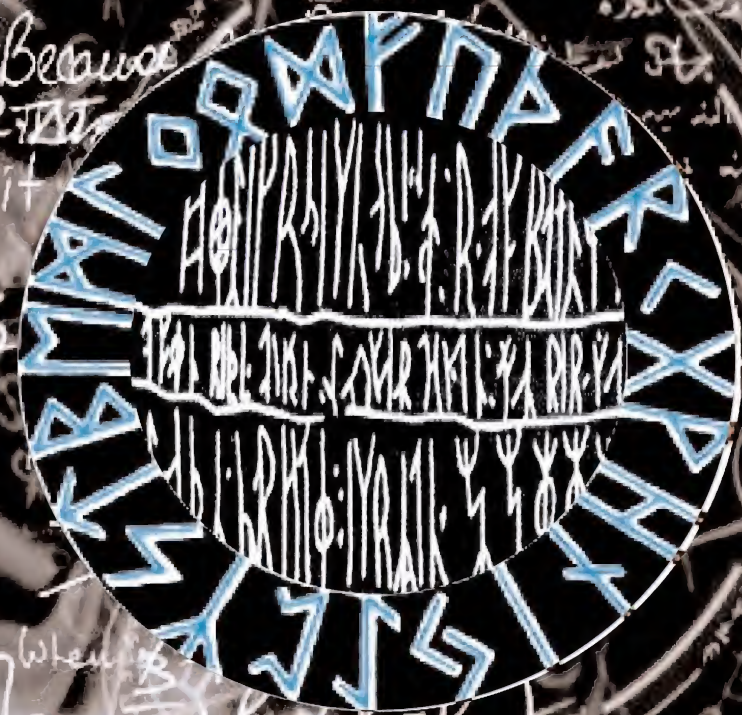
$$R(T_3 - T_2) = \frac{3}{2} nR \left[ \frac{P_2 V_1}{nR} - \frac{P_2 V_2}{nR} \right]$$

$$r = \cos \theta \quad \text{for } 0 \leq \theta \leq \pi/2$$

$$\Delta V - W = \int_{V_1}^{V_2} P dV$$

$$= \frac{1}{2} P_2 (V_1 - V_2)$$

Because



When

$$r = \cos \theta \quad \text{for } \pi/2 \leq \theta \leq \pi$$

$$y = 5$$

$$5 = 4 + 1 = \pi$$

$$5 = A_1 - 0$$



$$\cos \pi = -1$$

$$y = 0$$





$$r = \sin \theta \quad \text{for } 0 \leq \theta \leq \pi/2: \quad (1, \pi/2), (1/2, \pi/2) \quad 0 \leq \theta \leq \pi/2$$

$$\frac{1}{2} (V_1 - V_2) = \underline{\underline{P_2 (V_2 - V_1)}}$$

$$dv = - \frac{1}{r} \left( \frac{1}{r} \right) dr = - \frac{1}{r^2} dr$$

$$2 (T_2 - T_1) = - \kappa R \cdot \left[ \frac{1}{r} \right]_{r_1}^{r_2} = \frac{\kappa R}{r_1} - \frac{\kappa R}{r_2} = 2 (V_2 - V_1)$$

$$r = \sin \theta$$



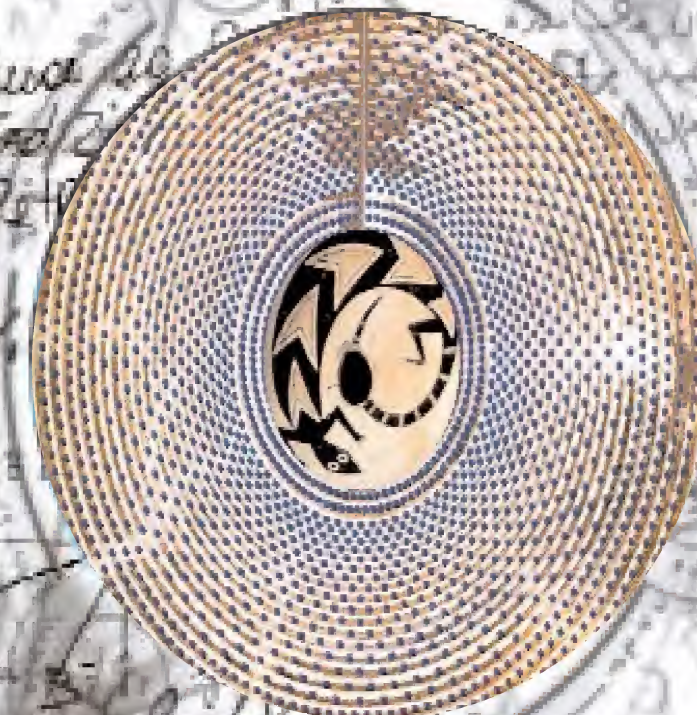
$\theta$	$r$
$\pi/6$	$1/2$
$\pi/3$	$\sqrt{3}/2$

$$\kappa R (T_2 - T_1) = \frac{3}{2} \kappa R \left[ \frac{1}{r} \right]_{r_1}^{r_2}$$

$$r = \cos \theta \quad \text{for } 0 \leq \theta \leq \pi/2$$

$$V - V_1 = \frac{1}{2} \kappa R (V_1 - V_2)$$

$$= \frac{1}{2} \kappa R (V_1 - V_2)$$





$$M = \frac{1}{n!} \left( \frac{1}{\omega} \frac{d}{dz} \right)^n \left( \frac{1}{\omega} \right) = \frac{1}{n!} \left( \frac{1}{\omega} \right) \left( \frac{1}{\omega} \right)^n$$

1000000  
100 TeV

$$M_{ij} = A B_i \cdot B_j \cdot (k + t)$$

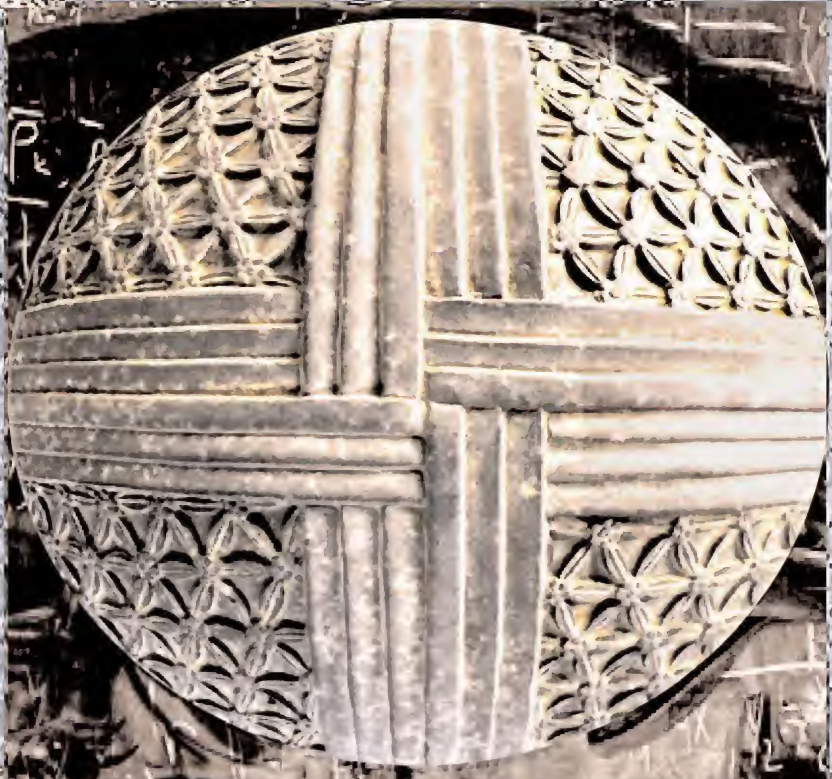
$$\det M = 0$$

$$HS = 1 + 4t^2 + 9t^4 + 16t^6 + \dots$$

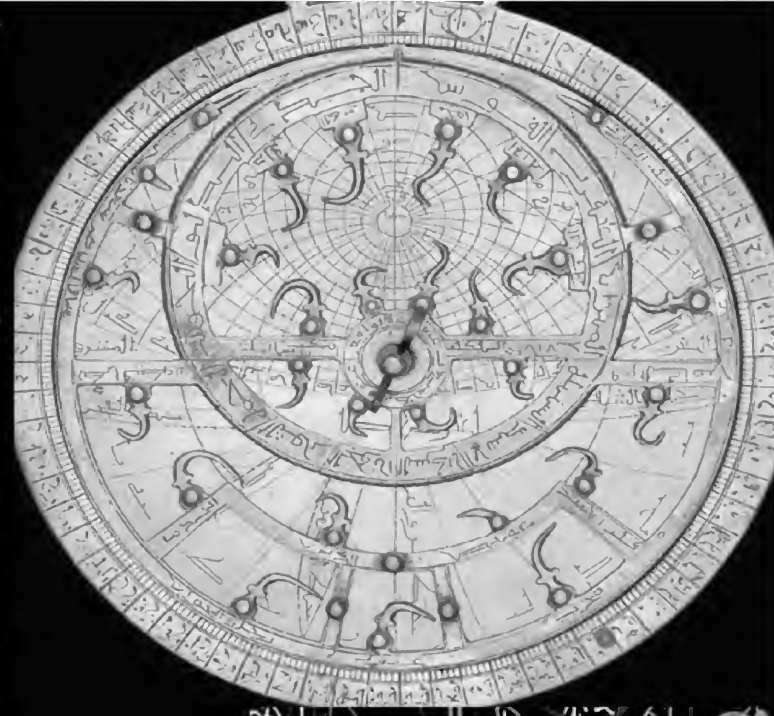
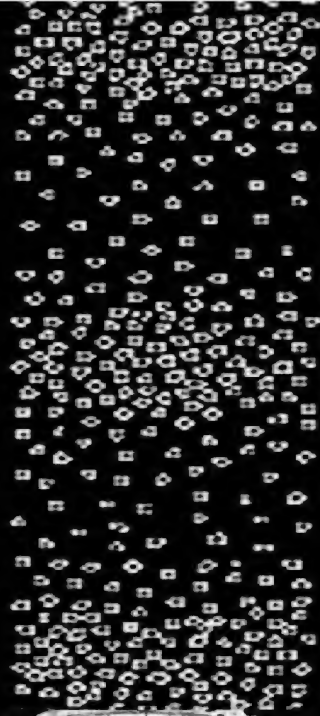
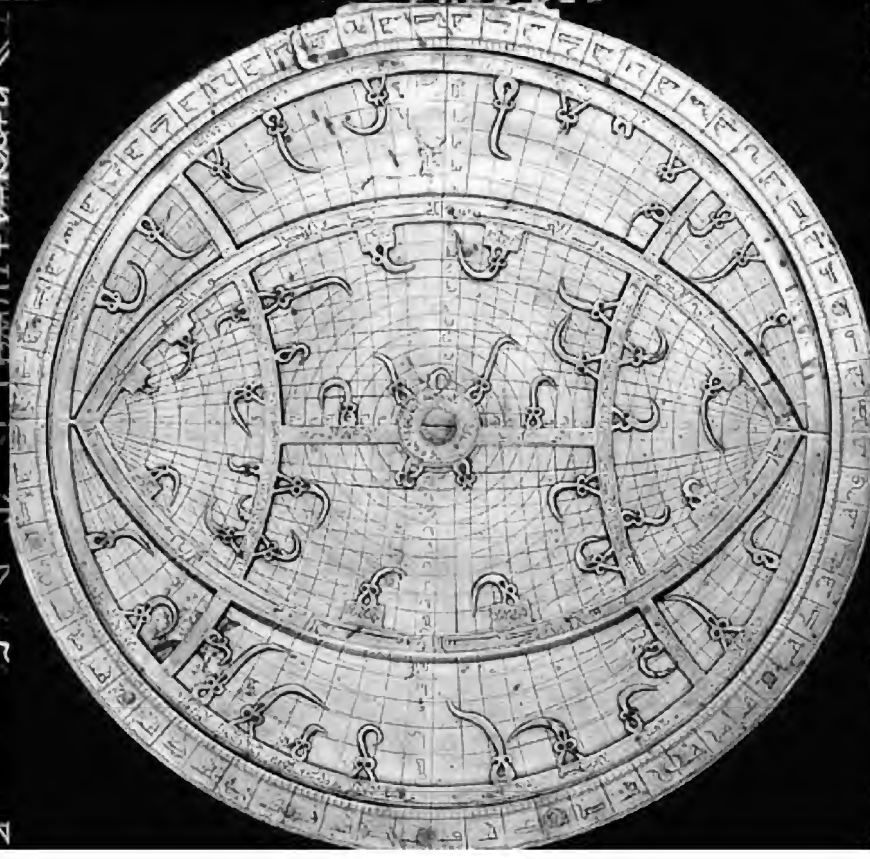
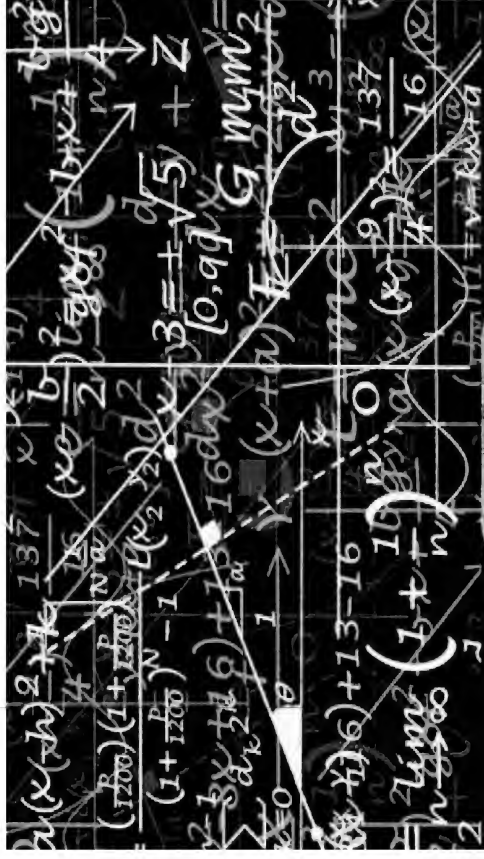
$$f(t) = \frac{1}{(1-t)(1-t^2)(1-t^3)} = 1 + t + 2t^2 + 3t^3 + \dots$$

$$1 \left( \frac{1}{1-t} \right)^2 = \frac{1}{(1-t)^2} = 1 + 2t + 3t^2 + \dots$$

$$g(t) = \sum_{k=0}^{\infty} f(t^k)$$







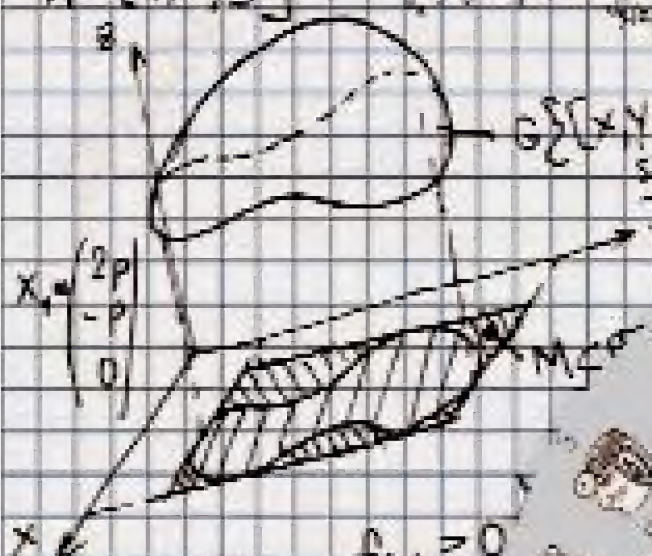


$$A = [1, 0, 3]$$

$$\int_{\gamma} \langle \mathbf{g}, d\mathbf{u} \rangle = \int_{\gamma} \langle \mathbf{T}(t) \rangle dt = \langle \mathbf{F}(\mathbf{u}) \rangle_{\gamma(a)}$$

$$\{[x, y] \in M, 0 \leq z = f(x, y)\}$$

$$\left( \frac{\partial \psi}{\partial x}, \frac{\partial \psi}{\partial y} \right) = (U, V)$$



$$G([x, y, z] \in E_3 \mid \sin z \leq \frac{z}{2} - 1)$$



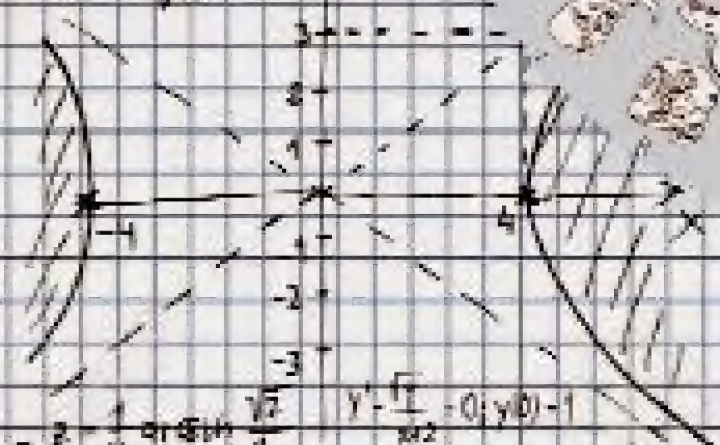
$$G = g_{\text{rad}}(A) = (F_x'(A), F_y'(A), F_z'(A))$$



$$f(x) \geq 0$$

$$x^2 + x^2 + y^2 + z^2 \leq x + y + z$$

$$R_0 = \frac{\sqrt{1000}}{3\sqrt{\pi}} \approx \frac{10}{3\sqrt{\pi}} \approx 1.9$$



$$e^2 - xyz = e, A[0, e, 1]$$

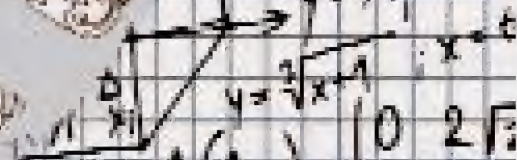


$$\Delta A = \begin{vmatrix} \frac{\partial^2 F}{\partial x^2}(A) & \frac{\partial^2 F}{\partial x \partial y}(A) \\ \frac{\partial^2 F}{\partial y \partial x}(A) & \frac{\partial^2 F}{\partial y^2}(A) \end{vmatrix}$$

$$\overline{y^2} = 2 \sum_{i=1}^n (A_i x_i)$$

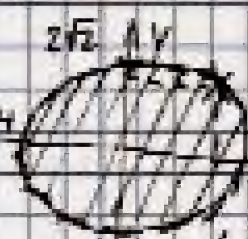
$$m_i = \int_{\Omega} f(x_i) dx_i$$

$$\frac{\partial f}{\partial x_i}(A) z$$



$$\Delta(A_z) = \begin{vmatrix} 0 & 2\sqrt{2} \\ 2\sqrt{2} & 0 \end{vmatrix}$$

$$J(A) = \sqrt{0.16}$$



$$\frac{x^2}{16} + \frac{y^2}{8} \leq 1$$



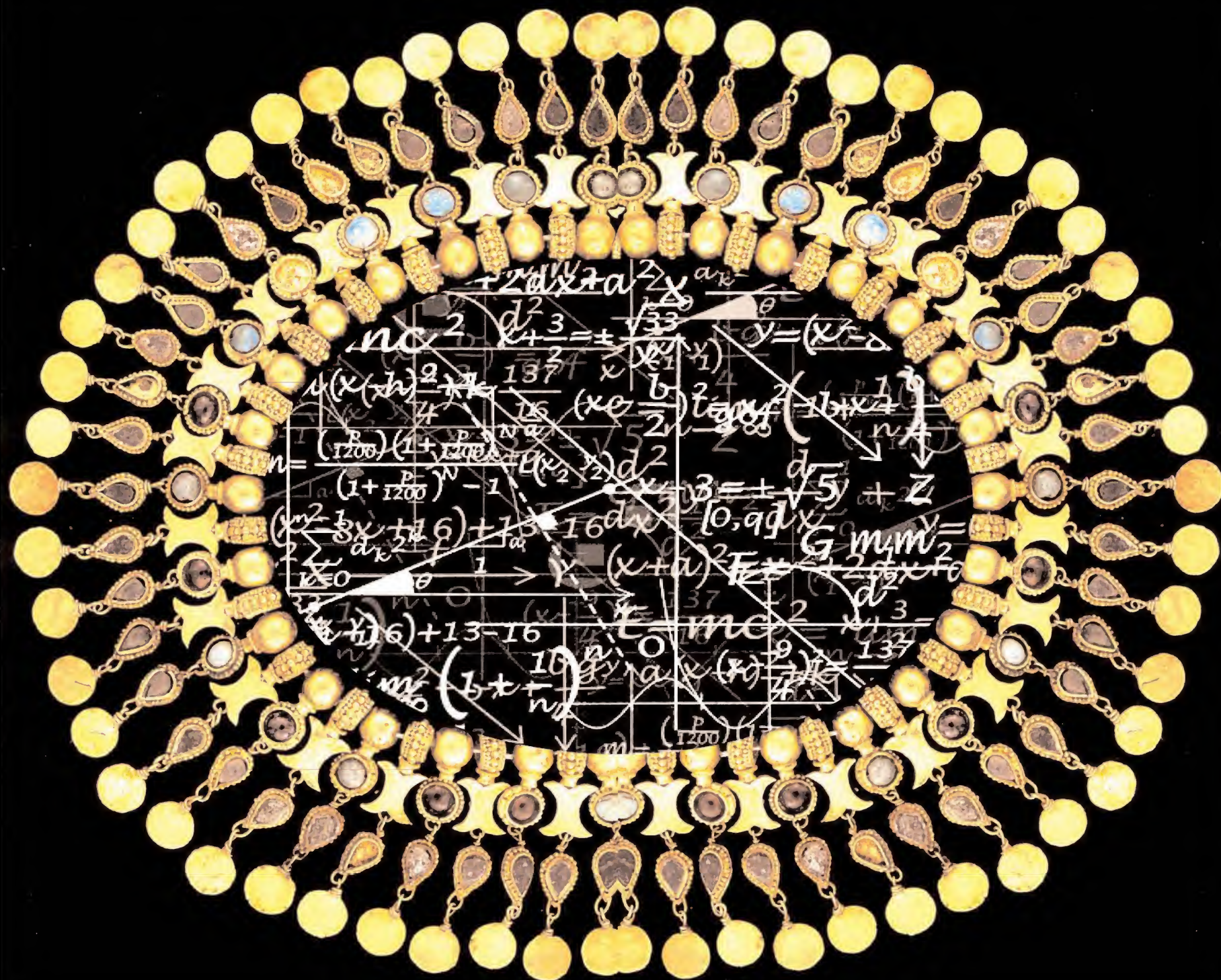
$$\frac{\partial^2}{\partial x^2} = 2, \frac{\partial^2}{\partial y^2} = 2$$

$$x^2 + y^2 + z^2 \leq 1$$







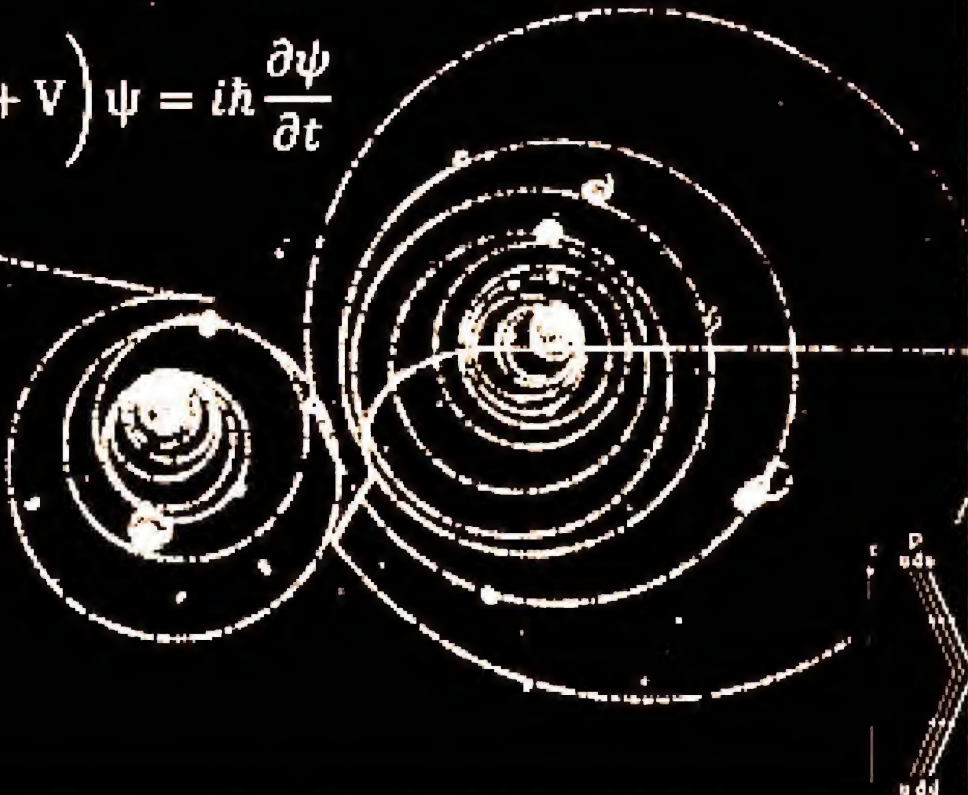




$$-\frac{\hbar^2}{2m} \nabla^2 \psi(\mathbf{r}) + V(\mathbf{r}) \psi(\mathbf{r}) = E \psi(\mathbf{r})$$

$$\left( \frac{-\hbar^2}{2m} \nabla^2 + V \right) \psi = i\hbar \frac{\partial \psi}{\partial t}$$


$\Delta x_i \Delta p_i \geq \frac{\hbar}{2}$



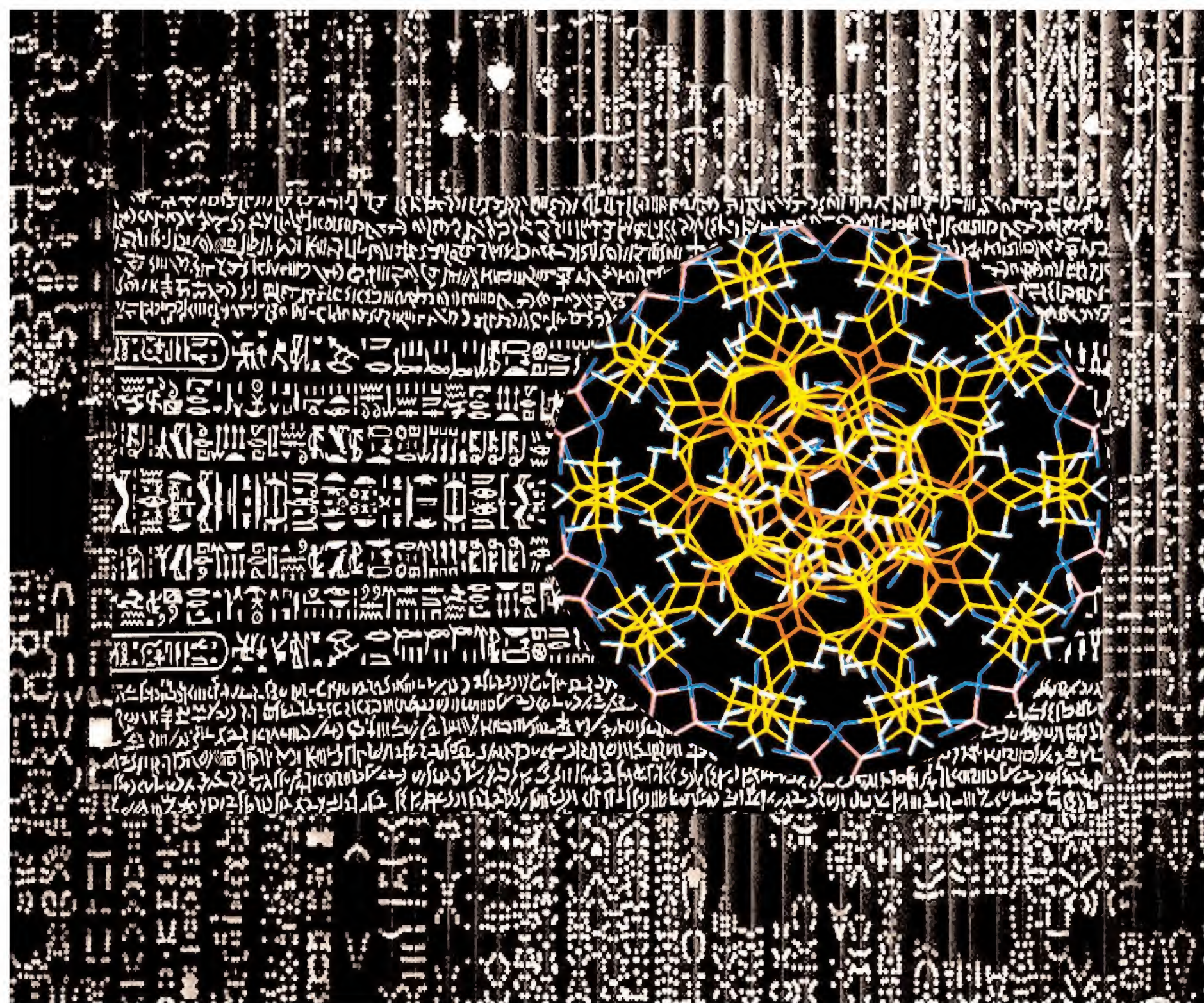
The diagram shows two overlapping atomic models. Each model consists of a central nucleus (a cluster of red and yellow spheres) surrounded by concentric circular orbits (dashed lines). Small blue spheres representing electrons are positioned on these orbits. The two atoms are shown overlapping, with their orbits intersecting. A dashed line connects the two nuclei. In the bottom right corner, there is a small legend with labels: 'p' for proton (red), 'n' for neutron (yellow), 'e' for electron (blue), and 'u d d' for quarks (smaller spheres within the nucleus).

$$\left( 3mc^2 + \sum_{k=1}^3 \alpha_k p_k c \right) \psi(\mathbf{x}, t) = i\hbar \frac{\partial \psi(\mathbf{x}, t)}{\partial t}$$

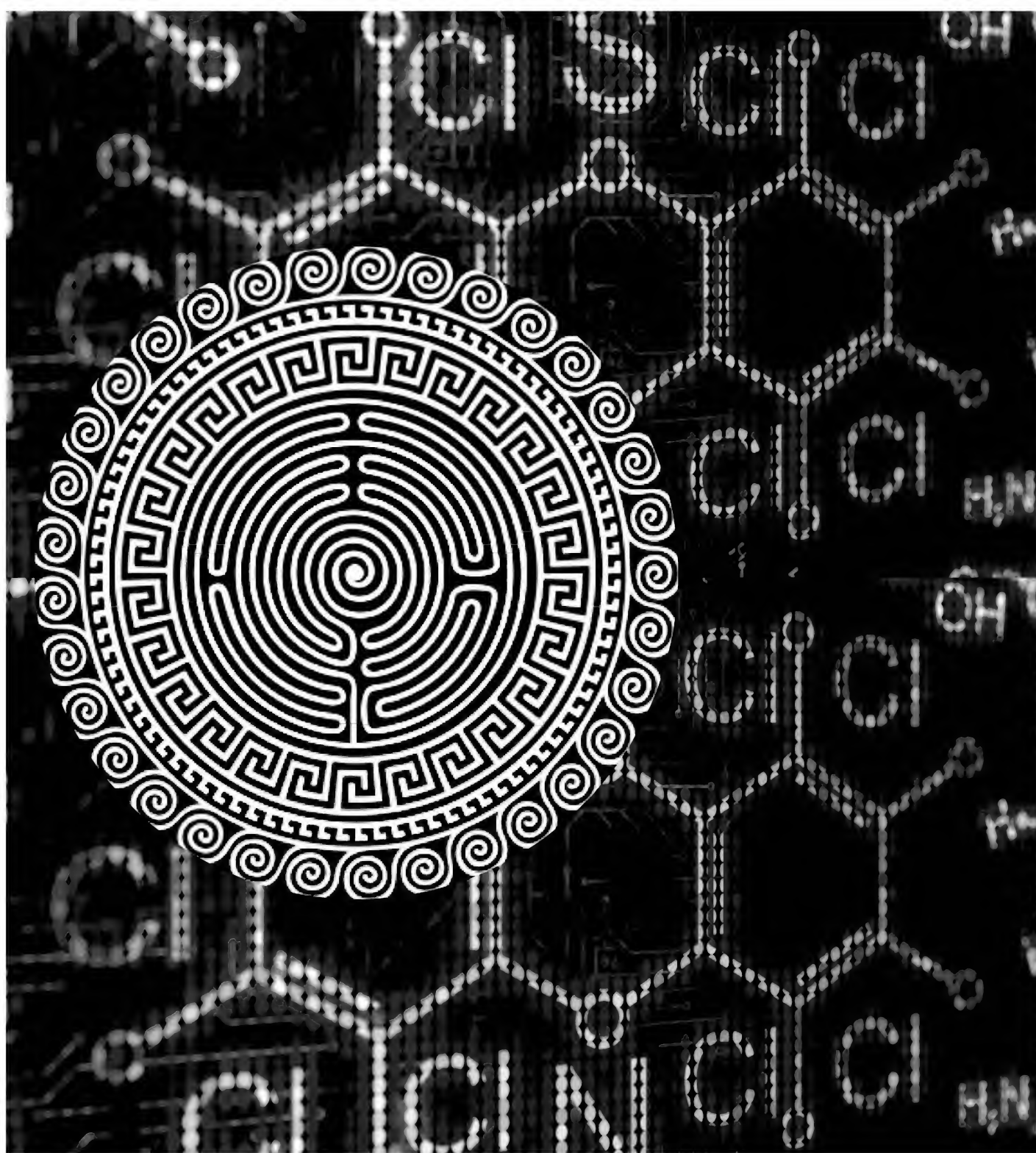



$$i\hbar \frac{\partial \psi}{\partial t} = \frac{\hbar c}{i} \left( \sum_i \alpha_i \frac{\partial \psi}{\partial x_i} \right) + \alpha_4 mc^2 \psi$$









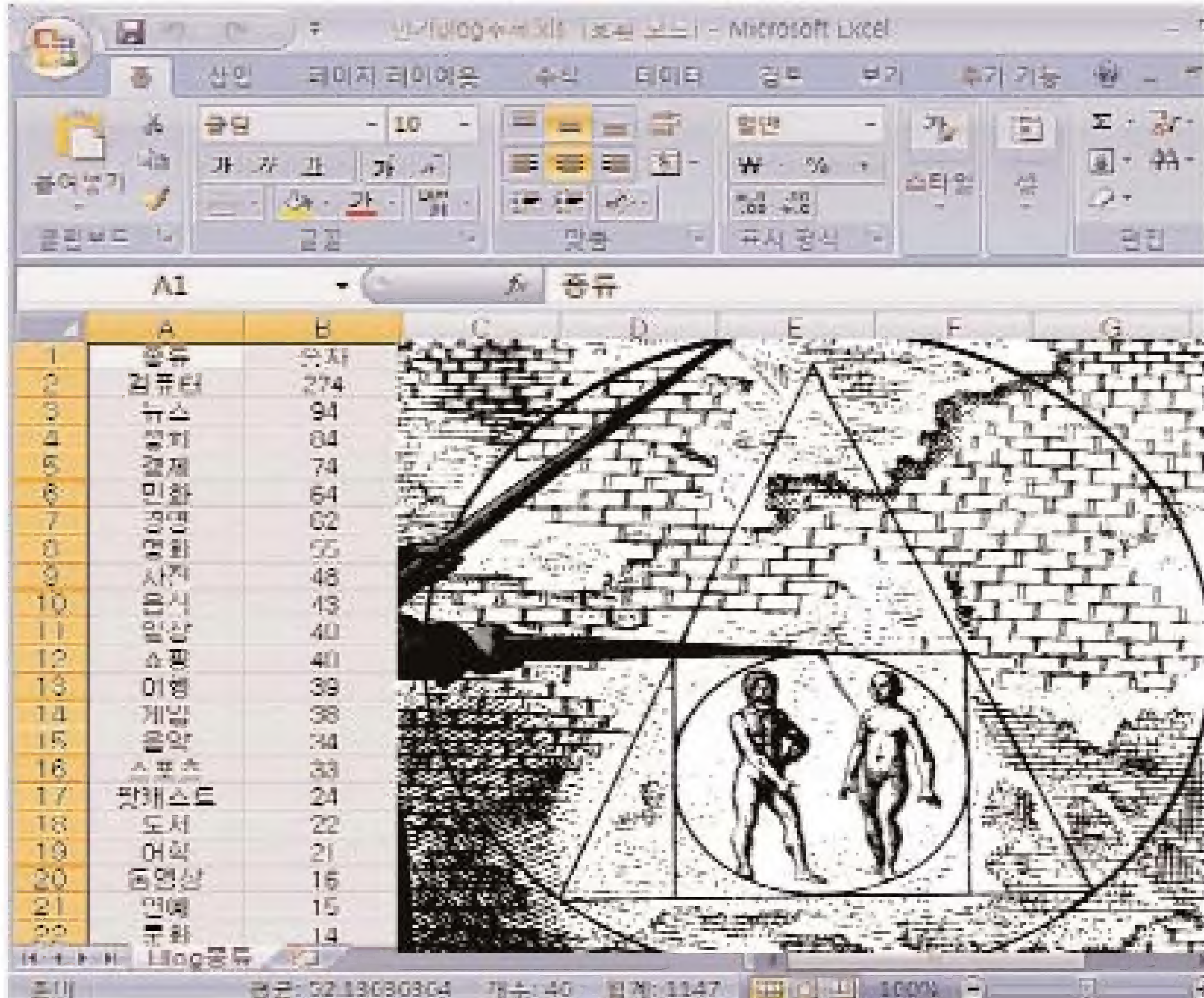


```
netalx16 ip/secrets.txt
netalx16 ip/secrets.txt
Hello World
I have a
I like t
and I Love Linux...a
netalx16 0@mybox /tmp
ercrets.txt
enter a
/verifyin
netalx16
msg.txt
netalx16
J2FsdGVhbnQ=
bgJEoI7F
b4rZuOKL
netalx16
```



qWAwHc+W10  
HsBEzVWSwfn







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\* የታሪክ ምዕራፍ ስም

Handwritten signature: H. P. R. Y. S. R. F. R. H. O. H. R. P. Y. S.

[illegible]

\* 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919. 920. 921. 922. 923. 924. 925. 926. 927. 928. 929. 930. 931. 932. 933. 934. 935. 936. 937. 938. 939. 940. 941. 942. 943. 944. 945. 946. 947. 948. 949. 950. 951. 952. 953. 954. 955. 956. 957. 958. 959. 960. 961. 962. 963. 964. 965. 966. 967. 968. 969. 970. 971. 972. 973. 974. 975. 976. 977. 978. 979. 980. 981. 982. 983. 984. 985. 986. 987. 988

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МОНРАЙКЪ: РЪБЪ: АРЪ:

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\* የታሪክ ምዕራፍ: የግልጽ ምዕራፍ

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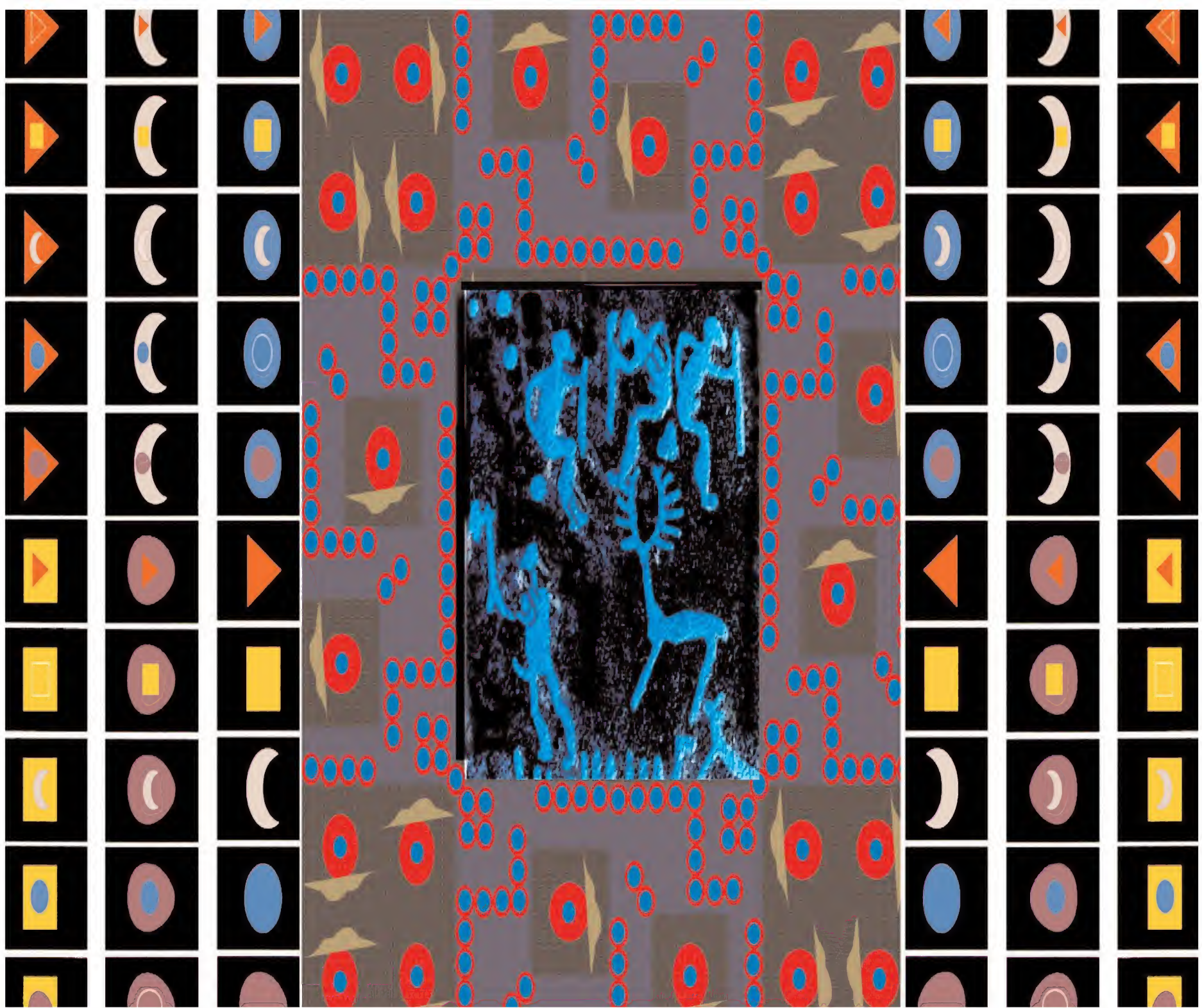
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\* ተቅብሎቸው፡ ያላገቡ ነፃነቶች

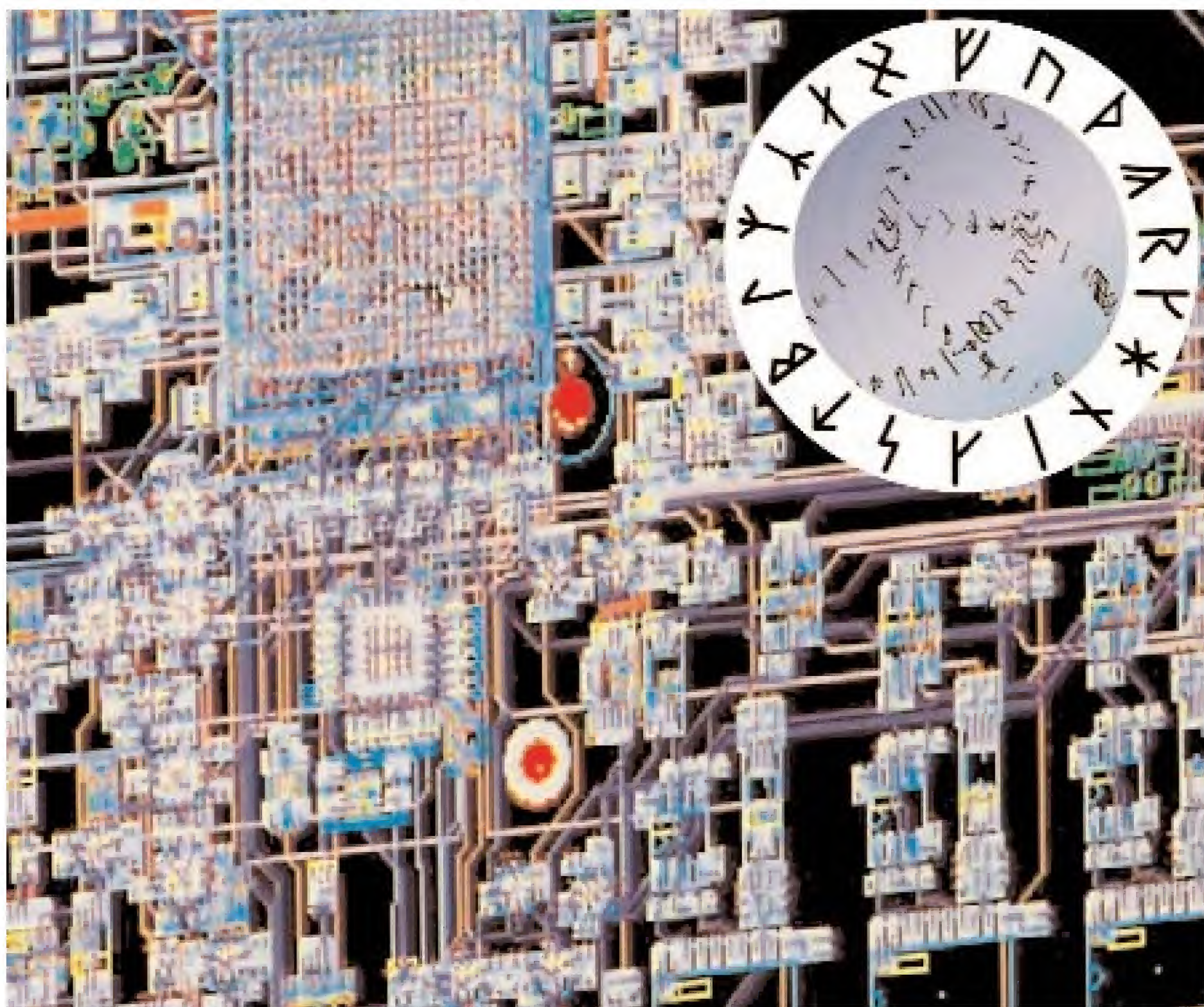












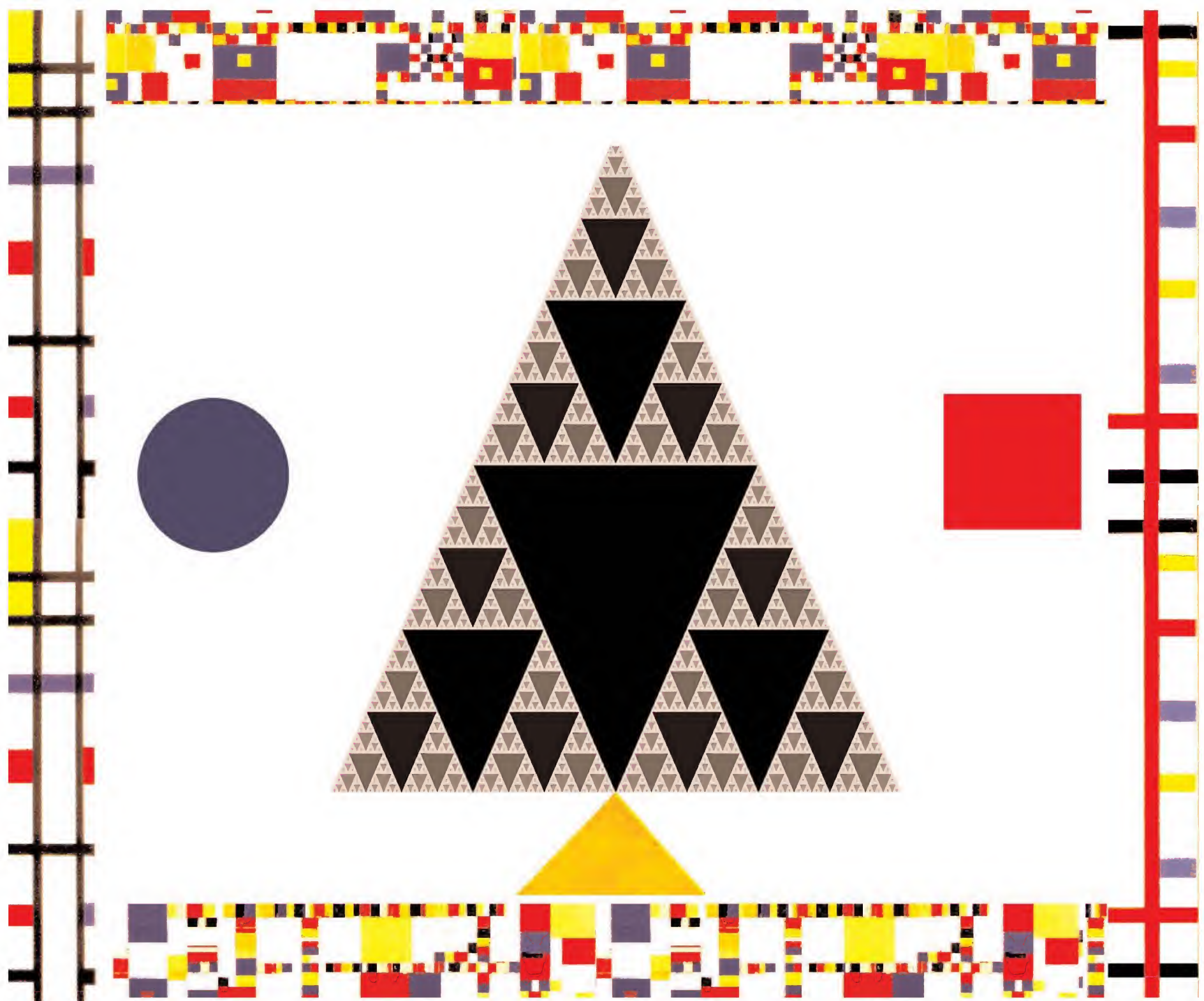














# Classical Physics

Space, Large Distances  
Newtonian Mechanics  
Relativity  
Thermodynamics  
Plasma Physics, Magnetism  
Optics

# Modern Physics

Small Space, Small Dist.  
Relativity  
Atomic Physics  
Nuclear Physics  
Electronics

# S.I. units

Mass - kg  
Time - seconds (s)  
Distance - meter  
 $\frac{1}{s^2}$  or  $\frac{1}{s^2}$  Derived units

Kinematics - the study of the motion with regard to its objects

## Position

Displacement (m)

$$\Delta x = x_{\text{final}} - x_{\text{initial}}$$

$x$  = position

Velocity - the speed of an object and the direction the object is moving

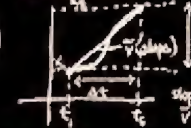
Velocity (m/s)

$$v = \frac{\Delta x}{\Delta t}$$

average velocity equals the change in position over the change in time

instantaneous velocity  
 $v = \lim_{\Delta t \rightarrow 0} \frac{\Delta x}{\Delta t}$

## Position vs Time



the slope of a straight line against between two points on a position versus time graph is the average velocity between those.

Use arrows to indicate direction.

- arrow points toward motion the speed is constant.
- arrow points in the opposite direction

Acceleration equals zero if the average velocity and the instantaneous velocity are the same.

## Acceleration

(m/s<sup>2</sup>)

$$a = \frac{\Delta v}{\Delta t}$$

$$a = v_f - v_i$$

average acceleration equals change in velocity over the change in time  
Acceleration has both a magnitude and a direction.

## Velocity vs. Time

Slope =  $a$

$$v = \int a dt$$



$$\sin(\alpha) = \frac{A_y}{A} \quad \sin(\beta) = \frac{A_y}{A}$$

$$A = \sqrt{A_x^2 + A_y^2}$$

$$A = \sqrt{A_x^2 + A_y^2}$$

$$A = \sqrt{A_x^2 + A_y^2}$$

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$$A = \sqrt{A_x^2 + A_y^2}$$

(the reference to a change in motion)

In the absence of unbalanced forces, the velocity remains constant

The sum of the forces on a given object is proportional to the object.

The constant of proportionality is called the mass

The sum of the forces on an object is called the net or resultant force

weight =  $mg$  (m/s<sup>2</sup>)

Both forces should not be included on the same free-body diagram

## 3rd Law

If object #1 exerts a force on object #2, then object #2 exerts a force on object #1 that is equal in magnitude and opposite in direction.

For every action there is an equal and opposite reaction.

Both forces should not be included on the same free-body diagram

## Rules of Projectile Motion

- The x and y directions of motion can be treated independently
- The x direction is uniform, with  $a_x = 0$
- The y direction is free fall,  $a_y = -g$
- The initial velocity can be broken down into its x and y components.

(x Direction)  $a_x = 0$

$$v_x = v_0 \cos \theta = v_x = \text{constant}$$

$$x = v_x t = \text{distance along the x-axis (assuming } x_i = 0)$$

This is the only equation for the x direction, since there is no force acting in that direction

(y Direction)  $a_y = -g$

$$v_y = v_0 \sin \theta$$

positive direction is upward, uniformly accelerated motion, so the motion equations still hold.

